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BRITISH HOVERCRAFT CORPORATION

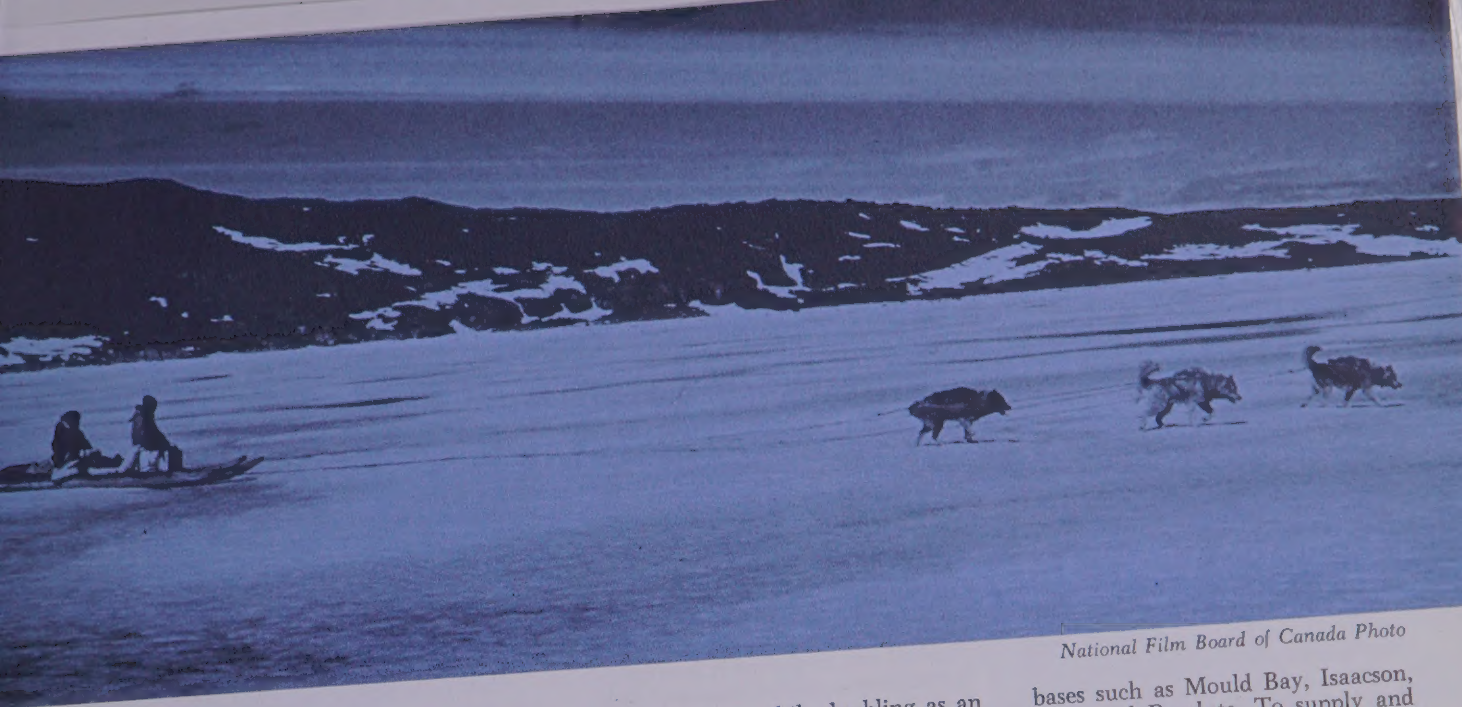
11 Leaflets

SRN6

2 Leaflets
SRN6
Irwin Wolff

BELL / BRITISH HOVERCRAFT TEAM

offers World Leadership in ACV's



National Film Board of Canada Photo

in the northern territories. Trucks are employed, for instance, in the Yukon, in the Great Slave area, and to link the southern transportation systems with the Mackenzie River area.

The outlook for more roads in the north is not good. By and large, building conventional roads is prohibitively expensive. There has been a meager attempt to lay snow roads in the area between the Mackenzie River and Great Bear Lake. But they are used for the most part by soil exploration crews, travelling in … vehicles; the roads are not …

feeder airlines while doubling as an alternate mail distributor.

Education. Canada's indigenous northern citizens—to a large extent Indian and Eskimo—can be taught to farm, serve as mechanics, and the like. ACVs could bring them to training centers. Likewise, their children could be sent to schools that would be well built, well equipped, and centrally located. Admittedly, students would have to live in for the duration of the term, but with ACVs it would be a lot simpler for northern authorities to see to it that children catch up with their nomadic parents.

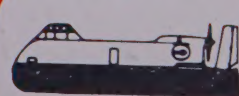
…ration. ACVs could put …

bases such as Mould Bay, Isaacson, Alert and Resolute. To supply and service them, the Government operates five helicopters and a few Otter and Beechcraft aircraft.

The report on the Tuk Tuk trials points out that the ACV "is ideally suited to many scientific roles. It could be used to ferry small parties and equipment between a central base and field locations up to about 50 nautical miles away. It could be used as a mobile laboratory complete with appropriate instruments installed in the craft. As such, the craft could travel across a variety of terrain types and stop as required to sample data. It would not be necessary to shut down the engine unless … to be stopped for pe-

9 Leaflets

BH-7



SK-10 ✓(2)

SR.N4 ✓

SR.N5/SK-5 ✓

SR.N6/SK-6 ✓ ✓

SK-9 ✓(2)
SK 9B ✓

SRN6

A HIGH PERFORMANCE OVERWATER TRANSPORT

british hovercraft corporation limited

THE SR.N6

The SR.N6 is a fast overwater transport now operating on scheduled passenger-carrying services including the English Channel and on specialised operations in the oil industry. The craft can be adapted to a variety of other roles, the degree of modification being dependent on customer requirements.

Being truly amphibious, highly manoeuvrable and compact in size, it can operate from relatively unsophisticated terminals, above the high water line.

Powered by a Bristol Siddeley 'Marine Gnome' gas turbine, which has a maximum continuous rating of 900 s.h.p., and fitted with 4 ft. skirts, the SR.N6 provides a comfortable ride for 38 passengers at 40 knots in 4–5 ft. seas. In calmer conditions a maximum speed of 56 knots can be attained with full payload.

The SR.N6 embodies well-proven items which have already accumulated a substantial amount of operating experience in many parts of the world under vastly differing conditions. It incorporates the following fully developed systems and components also used in the highly successful SR.N5, which has been in operation since April 1964.

Engine installation, transmission, fan and propeller

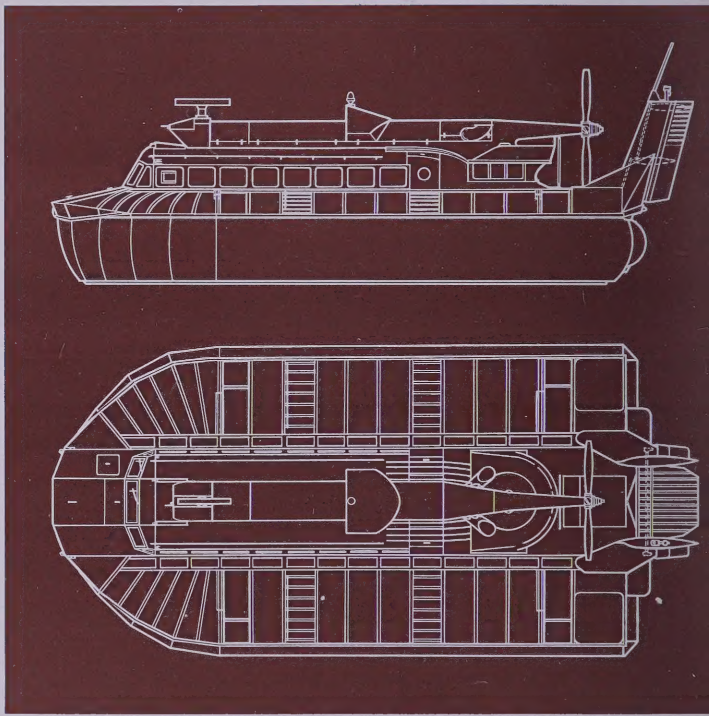
Commander's station layout and complete control system

Fins, rudders and elevators

Fuel, hydraulic and electrical systems

Basic skirt system

SPECIFICATION



Principal Dimensions

Overall length	48 ft. 5 in.	(14,76 m)
Overall beam	23 ft.	(7,01 m)
Overall height on landing pads	14 ft. 11 in.	(4,55 m)
Overall height from skirt hemline (hovering)	18 ft. 4 in.	(5,59 m)
Cabin length	21 ft. 8 in.	(6,6 m)
Cabin width	7 ft. 8 in.	(2,34 m)
Cabin floor area	166 sq. ft.	(15,42 sq. m)
Door aperture height	5 ft. 9 in.	(1,75 m)
Door aperture width	3 ft. 1 in.	(0,93 m)
Skirt length	4 ft.	(1,22 m)
Cushion area	673 sq. ft.	(63 sq. m)
Cushion load at 9 tons A.U.W.	30 lb./sq. ft.	(146 kg./sq. m)

Power and Transmission

Engine	One Bristol Siddeley 'Marine Gnome' B.S. Gn.1051
Max. rating	1,050 h.p.
Max. cont. rating	900 h.p.
Propeller type	One Dowty Rotol, four-bladed, variable pitch
Propeller diameter	9 ft. (2,74 m)
Lift fan type	One, Westland, centrifugal twelve-bladed, fixed pitch
Fan diameter	7 ft. (2,1 m)

Fuel

Fuel type	Standard turbine fuels or approved commercial kerosene
Fuel tank usable capacity	265 Imp. gall. (1 205 litres)
Fuel weight	2,120 lb. (962 kg.)

Cabin Layout

Passenger transport

Fixed seating for 38 passengers is contained within the cabin; the seats are provided with ash trays and paper racks. Provision for approximately 75 cu. ft. (2 cu. m) of baggage is available in two panniers located at the rear corners of the deck.

Freight transport

The quick-release seat attachment fittings in the floor serve the dual function of freight lashing points.

Number of lashing points	30
Approx. lashing grid	2 rows, 4 ft. apart at 14 in. (36 cm.) pitch

WEIGHT SUMMARY

(a) Equipped to the standard of a high-density passenger transport including furnished cabin with seats, VHF radio, safety and survival equipment.

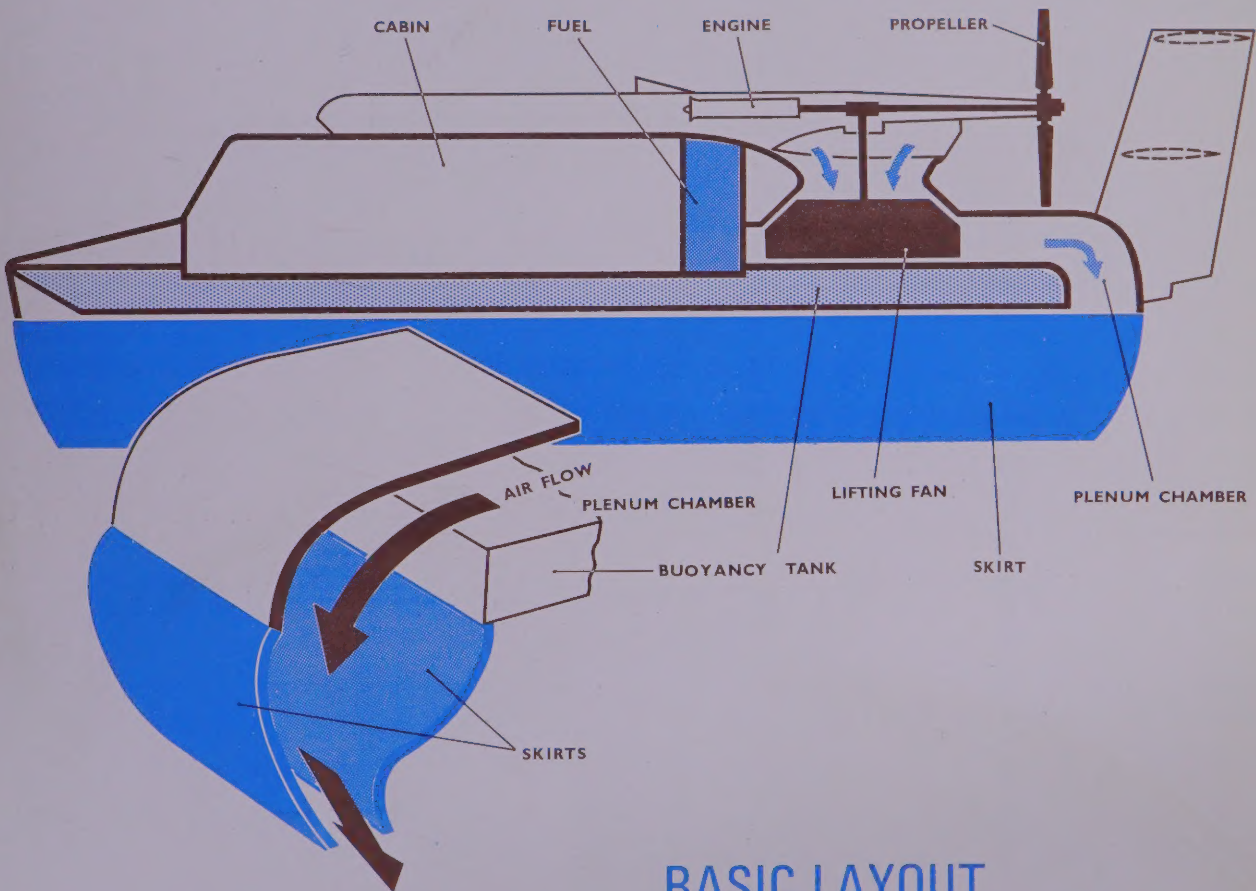
	lb.	*(kg.)*	*tons*	*(tonnes)*	*lb.*	*(kg.)*
Basic Weight					11,410	(5 175)
Disposable load:						
Commander	200	(90)				
38 passengers at 165 lb. (75 kg.) each	6,270	(28 155)				
265 Imp. gall. of fuel	2,120	(962)				
Total			3·83	(3,89)	8,590	(3 897)
Normal A.U.W.			8·93	(9,07)	20,000	(9 072)

(b) Equipped to a standard suitable for night operation, fitted with night operational equipment including radar, 2 crew, and seats for 35 passengers. Cabin heating and air conditioning also included.

					lb.	*(kg.)*
Basic weight					12,500	(5 675)
Disposable load:						
	lb.	*(kg.)*				
Driver and navigator	400	(181)				
35 passengers and luggage	5,780	(2,622)				
Fuel load	1,320	(599)				
			tons	*(tonnes)*		
Total			3·34	(3,39)	7,500	(3 405)
Normal A.U.W.			8·93	(9,07)	20,000	(9 072)

(c) Equipped as a freight transporter with cabin furnishing and seats removed. In this role the craft can be overloaded; typical examples are given below:

					lb.	*(kg.)*
Basic weight					10,900	(4 944)
Disposable load:						
	lb.	*(kg.)*				
Commander	200	(90)				
Freight	6,780	(3 075)				
Fuel	2,120	(962)				
			tons	*(tonnes)*		
Total			4·07	(4,135)	9,100	(4 128)
Normal A.U.W.			8·93	(9,07)	20,000	(9 072)
Overload case						
Disposable load					12,100	(5 488)
Overload A.U.W.			10·3	(10,46)	23,000	(10 433)



BASIC LAYOUT

The basis of the craft is a 15-inch deep buoyancy tank sub-divided into twelve watertight compartments.

The cabin is set into the plenum chamber and the buoyancy tank. Access to the cabin is by a combined bow loading door and ramp. The wide dorsal pod on the cabin roof contains provision for air conditioning and cabin heating.

The integrated lift/propulsion system employs a single gas turbine engine coupled to a centrifugal lift fan and a variable-pitch propeller.

There are two gearboxes, an engine reduction gearbox and a propeller/fan bevel gearbox.

Basic yaw and pitch control is achieved by two rudders and all-moving tailplanes mounted on and between the twin fixed fins. Control ports, using plenum chamber air, further enhance yaw control.

A system of 'skirt lifting' incorporated in the Westland patented skirts provides a means of accurate manoeuvring.

PERFORMANCE

The following performance figures are measured average values achieved from production trials.

With the exception of the overwave, gradient and obstacle clearance data, the performance has been corrected to equivalent calm water still air conditions.

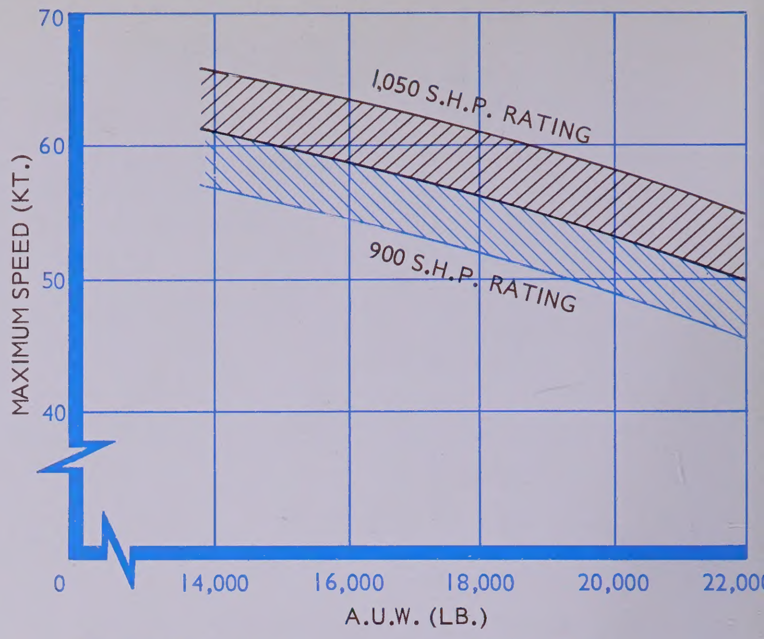
All values are quoted under I.S.A. conditions. No allowance has been made for the effects of 'plenum bleed' air intakes which have distinct advantages when operating in cold climates (de-icing) and minimise the ingress of sand and dust when operating in arid and desert areas.

It should be noted that the quoted maximum speeds assume the craft to be correctly trimmed; the 'Service Average' speed is a typical speed readily achievable by the average Commander.

The 'Service Average' speed is generally 90% of the maximum, this has been substantiated from experience obtained on various 'in-service' SR.N6s.

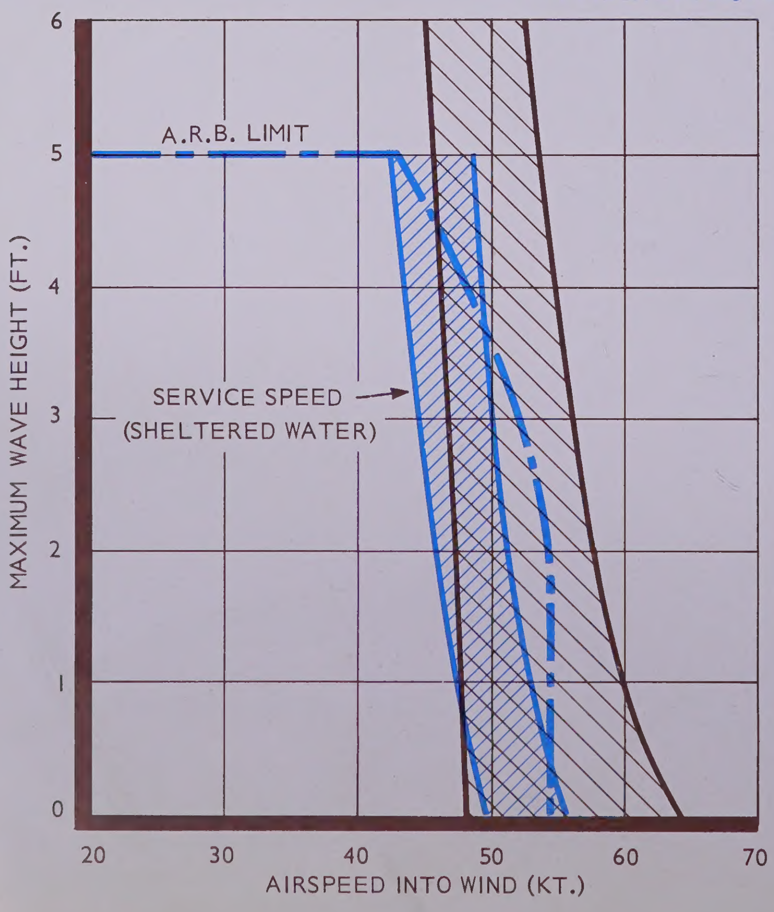
The quoted mean operating weight represents a craft equipped to a 'daylight' standard role, operated at a load factor of 75% and with half the fuel used.

Speed performance



Mean operating weight	17,300 lb. (7,847 kg.)
Maximum speed (optimum trim) max. power	60 knots* (111 km./hr.)
Maximum speed (optimum trim) max. cont. power	56 knots* (104 km/hr.)
Service average speed, max. cont. power	50 knots* (93 km./hr.)
Airspeed into wind in 4–5 ft. waves (sheltered water seas)	45–55 knots (83–102 km./hr.)
Time to accelerate to 50 knots (93 km./hr.)	38 sec.
Normal stopping distance from 50 knots (93 km./hr.)	275 yd. (252 m.)
Emergency ditching distance from 50 knots (93 km./hr.)	105 yd. (96 m.)
Normal turn radius at 40 knots (74 km./hr.)	385 yd. (352 m.)
Endurance at max. cont. power	3.6 hr.
Calm water range at max. cont. power	200 n. m.
Obstacle clearance, height of vertical step	3½ ft. (1 m.)
Negotiable gradient from standing level start	1:10

*When equipped as a 'night' standard craft, these speeds will be reduced by 1 or 2 knots due to the drag effects of the radar scanner.



Overwave performance

(Sheltered water)

FURNISHINGS AND EQUIPMENT

In the role of an overwater passenger transport, SR.N6 is normally equipped to either a 'daylight' or 'night' operation standard.

Furnishings

	'Day standard'	'Night standard'
Cabin walls and ceiling	Sound proofed and faced with cream coloured trim	
Cabin floor covering	Grey coloured 'Lionide'	
Passenger seats, sage green	38	35
Crew Stations		
Commander's station	Starboard side, forward	
Navigator's station	—	Port side, forward
Commander/Navigator partitioning	—	Fixed panels and gangway curtain

Systems

Cabin ventilation	Forced air type	
Cabin heating	Optional	Optional
Cabin air conditioning	Optional	Optional
Cabin lighting	Roof strip lights	

Communication and Navigation Equipment

Radio	Redifon VHF Type GR 289	
Radar	—	Kelvin Hughes Marine Type 17
Intercom.	—	Commander/ Navigator
Compass	Bendix (Proops) Magnesyn	—
Standby compass	Smiths E2B	Smiths E2B

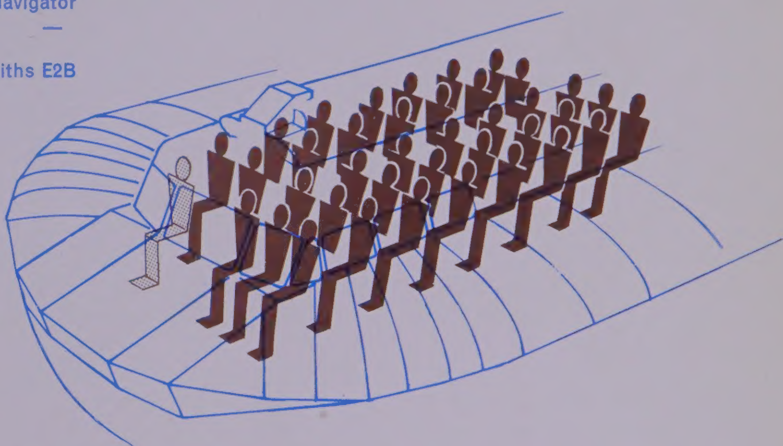
Special Night Equipment

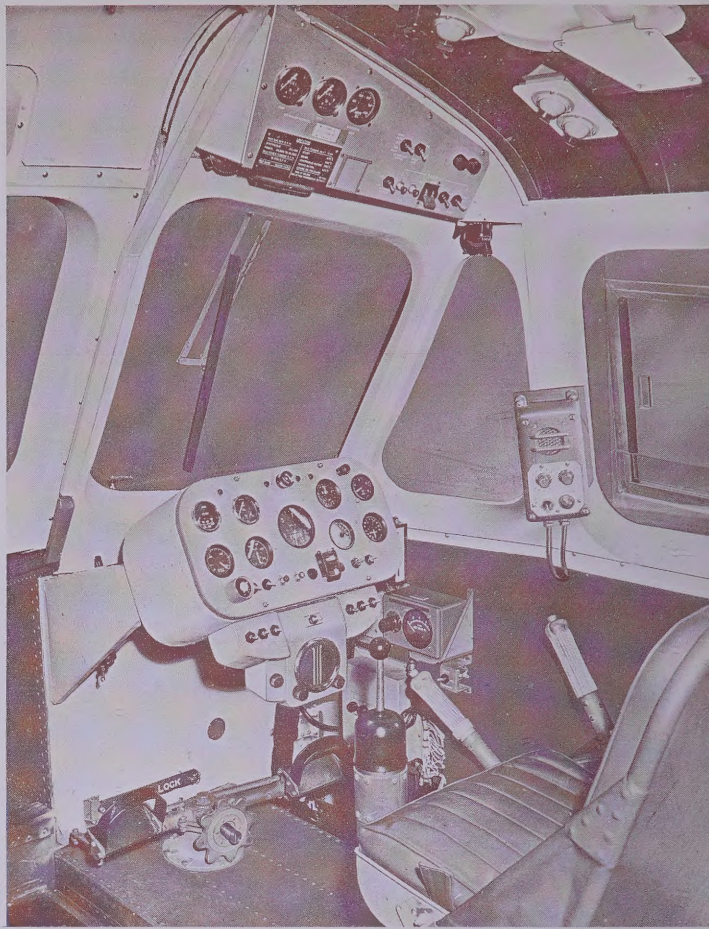
Steerable searchlight	—	Harley Type 500
Gyro compass	—	Sperry G4B
Rate-of-turn indicator	—	Smith Type 14, V914
Navigator's night lighting	—	Butler Model 1589M

Safety and Marine Equipment

	Day	Night
Stowed life jackets (min.)	39	37
Inflatable life rafts	2	2
Stowed portable fire extinguishers	2	2
Stowed axes	2	2
Anchor complete, floating rope, signal pistol, aldis lamp, bilge pump, torch, entrance door key, first-aid kit	1 each	1 each

Note: Consideration can be given to fitting additional or alternative equipment to customers' requirements.





Commander's Station and Controls

The Commander's station is located forward at the starboard side of the cabin; the seat is on a raised platform providing excellent all-round vision.

The instrument panel situated in front of the Commander provides a simple presentation of all essential data, such as compass heading, air speed, propeller pitch and power turbine r.p.m. indicators, together with fuel and oil contents gauges and appropriate warning lights covering fire, low oil pressure, engine over-heating and generator failure.

Auxiliary controls are conveniently to hand for fuel ballast transfer, windscreen washing, wiping and heating, cabin lighting, navigation lights, fire extinguishing, etc. The control system consists of:

Two rudders, controlled by an aircraft-type foot-operated rudder bar, which are used for directional control and are supplemented by plenum chamber air bleed ducts fore and aft.

Two all-moving tailplanes, operated by a lever at the right-hand side of the Commander's seat, which are used for in-flight longitudinal trimming. A 45-gallon transfer fuel ballast system provides the primary means of longitudinally trimming the craft, and also constitutes a reserve fuel supply. Fuel transfer is switch-operated.

Skirt-lifting control at the four 'corners' of the craft is operated by hydraulic jacks through a 'joy-stick type' control centrally situated between the Commander's seat and the instrument panel. This control provides pitch and roll to assist manoeuvring. The engine is controlled by a twist-grip mounted on the propeller pitch control lever, also at the Commander's right hand, thus providing single-handed control of hover height and speed. Movement of the lever forward accelerates the craft.

Systems

Electrical

Conventional 28-volt, D.C. type. Power is supplied by a Westinghouse generator, giving an output of 140 amps. at 30 volts D.C., belt-driven from the primary gearbox. Secondary generation giving 400 c.p.s. 3-phase A.C. at 115 volts is from an inverter situated in the starboard bow compartment; a 24-volt battery is also located in the compartment. An external supply socket is provided.

Fuel

A flexible bag tank mounted aft of the rear cabin bulkhead contains the fuel and a single low-pressure, electrically-driven pump delivers the fuel to the engine high-pressure pump.

A single refuelling point is located on the port side of the craft at the cabin roof level.

Hydraulic and lubrication

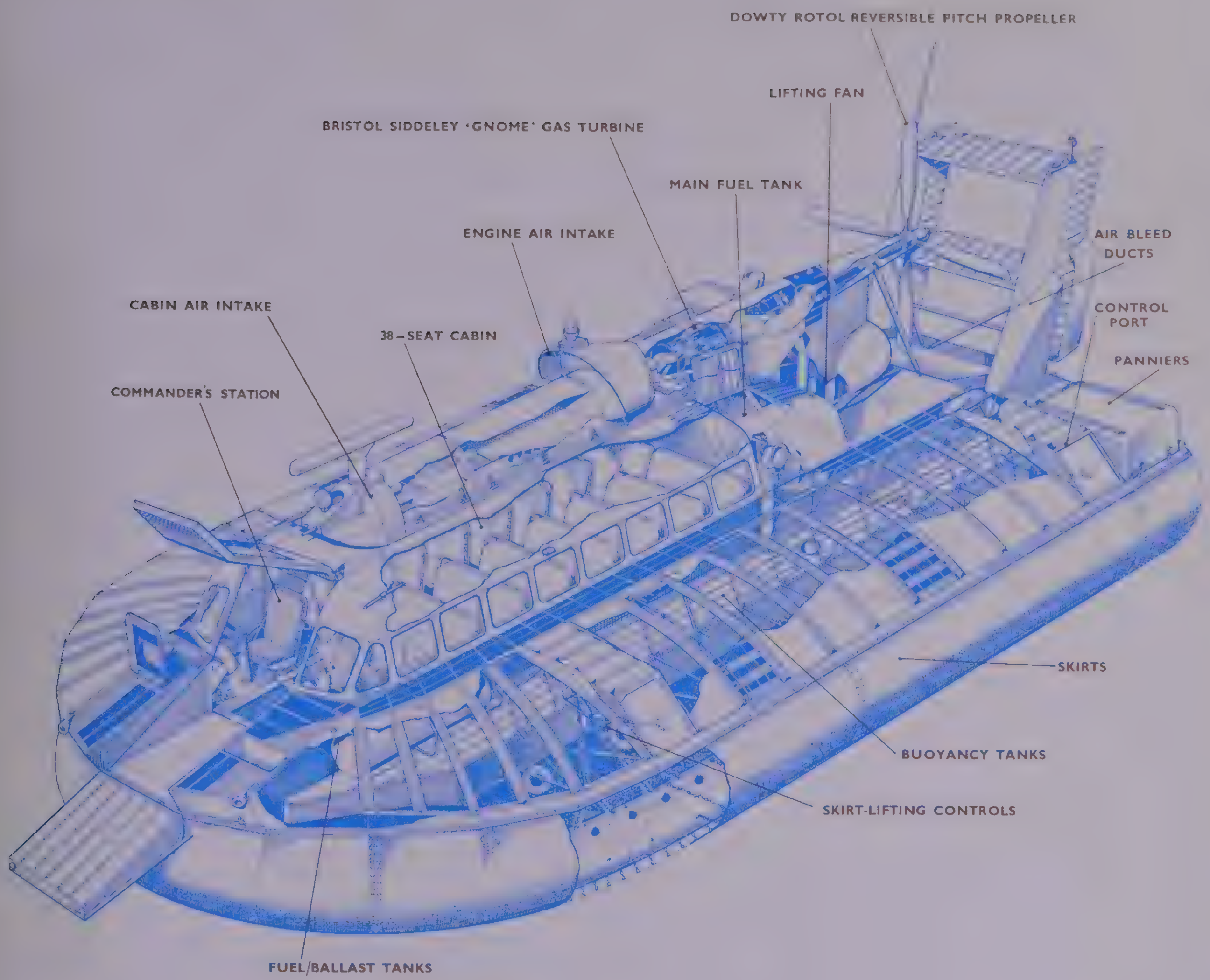
A dual function system to lubricate the engine and transmission gearboxes, and to supply oil to operate propeller pitch mechanism, skirt lifting and side control port jacks.

Ventilation

Cabin ventilation is provided through an air inlet located in the forward end of the wide dorsal pod.

Flexible Skirts

SR.N6 is fitted with the Westland patented skirts which extend 4 ft. below the solid structure. They are made of synthetic rubber-coated fabric which is highly durable and abrasion-resistant. The skirts are built in segments to facilitate ease of replacement, and are attached to the structure by simple 'piano-hinge type' fittings.



Servicing

Four slinging points are provided which, together with suitable ground equipment, allow the craft to be single-point lifted.

Points are provided at both the front and rear to permit the attachment of jacking beams to allow inspection and servicing of the skirts and to give access to the underside of the craft.

Twin towing eyes are provided at the forward end of the centre section. Six landing pads are located on the undersurface of the centre section, these allow the craft to be set down on roughly-prepared ground.

Fore and aft and thwartships walkways give ready access to all major components.

The side decking can be readily detached, this reduces the overall width to 8 ft. 4 in. and enables the craft to be more easily transported by road or air.

Protection from Salt Water

The majority of the structure is constructed from light-alloy material. For protection against corrosion it is cleaned and etch primed before assembly and, where necessary, the structure is painted inside and out with an epoxy-based paint.

The engine and cabin ventilation intakes incorporate a filtration system which extracts salt-laden moisture from the air in the engine bay and passenger cabin.

ROLES

In addition to its primary role as a passenger-carrying craft the SR.N6 is suited to alternative roles such as:

Search and Rescue

Equipped for sea rescue, accommodating stretcher cases and carrying medical stores.

Fire Fighting

Equipped with water pumps and monitors. Particularly useful in rivers and harbours.

Military Roles

With its amphibious capability the SR.N6 has immense potential as a military vehicle particularly in the beach assault and coastal patrol roles.

Publication No. S.P.1044 Issue Two April 1966 Printed in England

BHC british hovercraft corporation limited
YEOVIL SOMERSET, AND EAST COWES ISLE OF WIGHT, ENGLAND

OPENING UP CANADA'S NORTHERN TERRITORIES

by Irwin Wolfe

DOES the Canadian Government possess a fortune in its North, or does it possess a million-and-a-half square miles of frozen, useless geography located at the top of the world?

The experts are betting that Canada's northland can become truly wealthy by exploiting the vast resources lying beneath the northern surface. Rich oil reserves lie beneath Cornwallis Island, Bathurst Island and the Mackenzie River district. Because of today's poor transportation, however, it is only feasible now to mine areas in the southern strip of the territories, where they border the provinces.

Recent improvements to existing modes of transport, and the development of a new mode—the air cushion vehicle—have set a good many Canadians to wondering just where Canada goes from here with its northland.

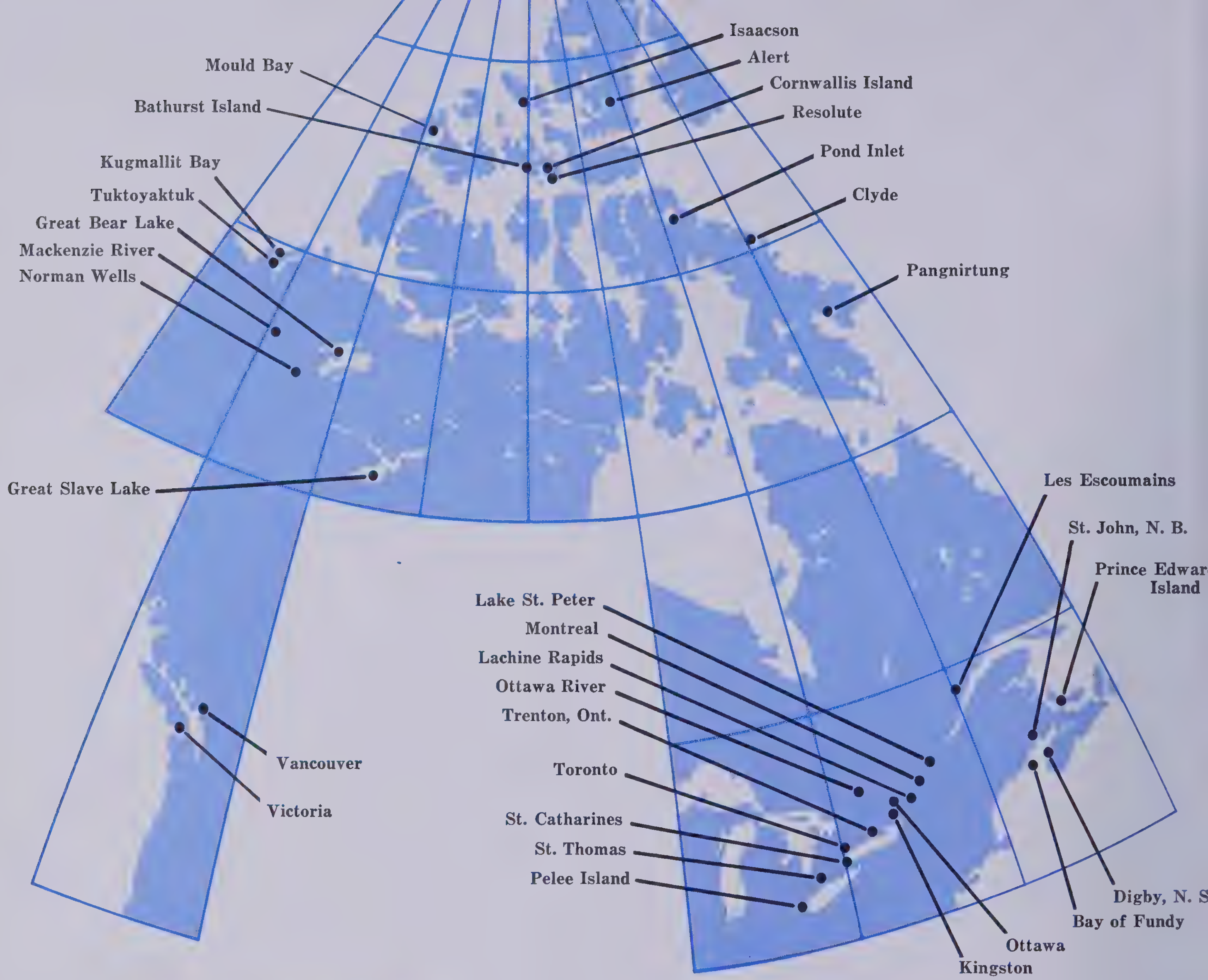
The C-130 or Hercules aircraft is now in regular supply operations in the North with the Royal Canadian Air Force. Snowmobiles are in more frequent use, even by the Eskimo. Another step forward was taken last year. Canada staged two trials of ACVs, one at Tuktoyaktuk and on the Mackenzie River, the other at Trenton, Ont.

Concerning the use of ACV s, we still hear the objection, "It's not economical." But since when has Canada instituted and maintained transport routes only when it was economical to do so? John Jenness of the Department of Northern Affairs & National Resources told the Canadian Association of Geographers: "In a sense, the situation there (the north) today is much the same as it was farther south a century ago, when rail builders possessed the daring and foresight to lead settlement into the Prairie Provinces; for the north is presenting us with the same risk of high costs and obscure markets that faced us in those days on the Prairies."

There is solid justification for the practice of the Canadian Government subsidizing transport routes essential to Canada's welfare. No other country in the world has so small a population (20 million) scattered over so wide an area. One estimate is that Canada could usefully employ 25 to 30 ACVs within the next 10 years.

The trials at Tuktoyaktuk (called "Tuk Tuk" from here on) took place from April 22 to May 30, 1966, as the winter ice cover was breaking up. They were mainly at Tuk Tuk and vicinity, over the fast ice in Kugmallit Bay (at the southern coast of the Arctic Ocean or Beaufort Sea), and 450 to 500 miles along the Mackenzie River from near its gulf to the village of Norman Wells. Temperatures ranged from —24° F to 60° F.

The Canada Defense Research Board's report on the Tuk Tuk trials indicates that the ACV is at home in the Mackenzie River area. This is significant because the types of ice and snow correspond to those in much of northern Canada. The ACVs took in stride regions of flat ice with drifts of wind-packed snow; rough first-year ice, and pressure ridges. The steepest slope cleared, in Tuk Tuk harbor, was 17 feet high and was negotiated successfully at an approach speed of 25 knots.



First Use of ACVs Expected In The South

IT MAY well be that the first ACV to be purchased or leased by the Canadian Government will be employed in southern Canada. Some uses there could pay for themselves today.

The technical capabilities of the craft were proved out by actual trials at Trenton, Ont., which began on Oct. 24, 1966, and continued for a month. A SK-5 chartered from Bell Aerosystems Canada was successfully put through a number of mothership, search and rescue, towing, and high seas operations by the Coast Guard wing of the Department of Transport. Five-foot seas were encountered, with winds blowing from 20 to 30 knots. During simulated rescue operations, basket litters were transferred from rafts to the ACV. During some of the tests, an 11-foot dinghy and a large turbine fire pump were lashed to racks on each side of the ACV, but they had little effect on operating performance.

Passenger runs offer the largest potential application for ACVs in southern Canada:

In the Maritime Provinces — Across the Bay of Fundy, between St. John, N. B., and Digby, N. S. and also between Prince Edward Island and the mainland.

Across Lake Erie—St. Thomas to Cleveland; Pelee Island to Canadian mainland.

Across Lake Ontario—Toronto to St. Catharines; Toronto to Rochester; Kingston to the U. S. shore.

On the Ottawa River — Montreal to Ottawa. (An ACV can easily overcome the rapids in the Ottawa River, just as it did the Lachine Rapids at Montreal.)

'Snow Lanes' Must Be Mapped . . .

Drawing upon the experience at Tuk Tuk, it can be assumed that the ACV would operate successfully over large areas of the north. Undoubtedly there are physical obstacles. A few of the off-shore ice pressure ridges might prove too massive for today's ACVs. The wrecker's ball might be the only way through. One source suggests maintaining a right-of-way onto the beach, just as airport runways are plowed after a snowstorm. In the long run, however, many of these obstacles can be overcome by simply building bigger machines with longer skirts. Bell Aerosystems, for example, says it will soon be making ACVs with skirts 8 feet high, and that in a few years it will be turning out ACVs 150 feet long, supported by skirts 10 to 12 feet high. The longer skirts, combined with improved radar and well-mapped ACV "snow lanes" in the more treacherous areas, will widen the portions of the north which future ACVs will be able to traverse.

Canada's far north transit routes are hardly impressive. Canada's only Arctic river of consequence, the Mackenzie, is also the only one in the north that is navigable and connects with the rail transportation system of the Canadian interior. That point is being driven home with increased force these days as activity booms in the Pine Point mines near the southern shore of Great Slave Lake. Last year they shipped 900,000 tons of ore.

The Great Slave Lake Railway, built two years ago, now makes it possible to move supplies by rail northward from the Canadian Provinces to the southern shore of Great Slave Lake. Here freight is transferred to barges for the run down the Mackenzie River, which has the lake as its source, and into the Arctic interior. But this barge trans-shipment is restricted to the summer months, and even then it is extremely inefficient, cumbersome and slow.

ACVs could make deliveries the year round, adding the dimension of speed to Mackenzie River transport. Ideally, cargo ACVs would run the full length of the Mackenzie. Making intermediate stops enroute, they would come up onto land and off-load cargo directly into settlement warehouses.

The Coast Guard — the seagoing fleet operated by the Marine Services of the Department of Transport — delivers annually about 100,000 tons of supplies to eastern Arctic ports for distribution to some 75 settlements and outposts. It must rely on ice-breakers, which are extremely inefficient as cargo carriers. Because of the ice, they get up to the Arctic late — in July and August — and they must leave early, by the end of September or early October. Much of the tonnage has to be delivered to open beaches, where the ACV would be in its element.

One expert estimates an immediate two to three-fold increase in efficiency if the Coast Guard ships moved north with ACVs as tenders. They could leave southern ports earlier—May or June—and stay perhaps till November. Life at such East Arctic ports as Clyde, Pangnirtung and Pond Inlet would be a lot easier.

After finishing its supplies-beaching operation, an ACV could carry out ice and navigational aids reconnaissance. When through patrolling, the ACV would return to its mother ship and all would proceed to the next port of call.

C-130 aircraft, Otters, and Beavers, as well as VTOL and STOL aircraft, can all play very useful roles in the north. Yet they have their limitations. A C-130 can land at Resolute, for example, only during mid-winter. The ice is too thin to support such a big aircraft—or even Beavers and Otters—during spring and fall. What's more, landing conditions are often hazardous. With ACVs, supply operations could continue unhindered.

Limited trucking operations exist

In British Columbia—from Vancouver to Victoria and to Seattle.

Patrolling is another good possibility. The Department of Transport is beginning a traffic control patrol between Montreal and Les Escoumains, which is about 40 miles down the St. Lawrence River. The Department must also maintain a pollution patrol. ACVs, because of their versatility, could do both and might also transport river pilots between ship and shore. During the winter, ACVs could conduct ice patrols in the Montreal harbor and in the shipping lanes leading from Montreal, especially those to Lake St. Peter.

Larger ACVs may be just the ticket for transporting crews and material to hydro-electric installations in northern Manitoba, in northern Quebec as at Manicouagan, and along the Aux Outardes River.

Production of ACVs capable of such service is expected to be under way soon in Bell Aerosystems' plant near Niagara Falls, where tools and an assembly line are being set up. Until now, virtually all of the testing and experimentation in Canada has been with the British Hovercraft's SR-N5 or its Bell Aerosystems equivalent, the SK-5. The new production facilities of Bell Aerosystems are scheduled to turn out a commercial model of the SK-5; a larger SK-6, capable of carrying 38 passengers, and the SK-9, a 25-ton craft which can transport 91 persons or 12 tons of payload.

With such a variety of models, appropriate craft will be available for most transportation needs envisioned for Canada in the near future. ■

Irwin Wolfe, 29, has gained close familiarity with Canada's prospects as an associate editor of "Canadian Transportation," published by Southam Business Publications. An article on improving transportation in Northern Canada, which he wrote in December 1965, brought comment from Northern Affairs Minister Arthur Laing and Prime Minister Lester B. Pearson.

He holds a commercial pilot's license and has traveled extensively throughout his native country. Born in Montreal, he speaks English and French. Mr. Wolfe has also been an associate editor of Business Management Magazine. He resides in the New York City area now, but he has retained his Canadian citizenship and frequently returns to the area on which he has become an expert.

National Film Board of Canada Photo

in the northern territories. Trucks are employed, for instance, in the Yukon, in the Great Slave area, and to link the southern transportation systems with the Mackenzie River area.

The outlook for more roads in the north is not good. By and large, building conventional roads is prohibitively expensive. There has been a meager attempt to lay snow roads in the area between the Mackenzie River and Great Bear Lake. But they are used for the most part by soil exploration crews, travelling in tracked vehicles; the roads are not good enough for wheeled vehicles. Using ACVs could obviate most, if not all, of the difficulties.

There are many more potential uses for ACVs:

Law enforcement. The Royal Canadian Mounted Police today patrol the vast area by dog sleds, snowshoes, snowmobiles, aircraft of many types; ACVs would be extremely useful.

Medical. While on patrol, law officers equipped with ACVs would also function as police ambulance teams. As matters now stand, there are periods when medical help simply cannot get into settlements. Even when medical teams are parachuted into northern outposts, they must often remain there during thaw and early freeze because the ice cannot support the landing weight of aircraft.

Mail delivery. Service now is abysmally poor; there is virtually no scheduled transportation of any kind between Canada's east and west Arctic regions. The ACV can serve effectively as a sort of jitney bus to feeder airlines while doubling as an alternate mail distributor.

Education. Canada's indigenous northern citizens—to a large extent Indian and Eskimo—can be taught to farm, serve as mechanics, and the like. ACVs could bring them to training centers. Likewise, their children could be sent to schools that would be well built, well equipped, and centrally located. Admittedly, students would have to live in for the duration of the term, but with ACVs it would be a lot simpler for northern authorities to see to it that children catch up with their nomadic parents.

Exploration. ACVs could put most northern exploration work on a 12-months-a-year basis. Mineral and scientific exploration work now must cease during break-up and freeze-up, when snow gets soft on land and no vehicles can move nor can any planes land. Field parties, for the most part, go idle, at great expense to the companies or government departments that send them in.

Efficient use could be made of ACVs in scientific forays involving hydrography (charting the ocean bottom), magnetic surveys (for keeping tabs on the magnetic storms causing radio blackouts all over the world), gravity surveys and seismological surveys. Typically, such teams must cover wide areas quickly, with only short stays in any location.

For some time now, thought has been given to using ACVs for surveys of the Polar Continental Shelf. The Department of Energy, Mines & Resources has about 40 men, almost all scientists, stationed at various bases such as Mould Bay, Isaacson, Alert and Resolute. To supply and service them, the Government operates five helicopters and a few Otter and Beechcraft aircraft.

The report on the Tuk Tuk trials points out that the ACV "is ideally suited to many scientific roles. It could be used to ferry small parties and equipment between a central base and field locations up to about 50 nautical miles away. It could be used as a mobile laboratory complete with appropriate instruments installed in the craft. As such, the craft could travel across a variety of terrain types and stop as required to sample data. It would not be necessary to shut down the engine unless the craft were to be stopped for periods longer than, say, 15 minutes. The space available in, and payload of, the craft would allow supplies for a small number of people for several days to be carried, as well as a reasonable amount of scientific equipment."

Better transportation, for any of a dozen purposes, is one of the area's most pressing needs. ACVs can abolish or overcome much of the isolation now an inescapable part of living "up North." The revolutionary new craft can bring reliable mail and medical service, serve as bus routes feeding air stops, and make possible schools that are better equipped and easier to reach. With these improvements, who knows, more people may actually move northward. Even if they don't, life could be a lot easier for those 50,000 or so Canadians who now make the northlands their home.

SK-9 90-PASSENGER AIR CUSHION VEHICLE

BELL AEROSYSTEMS - A textron COMPANY

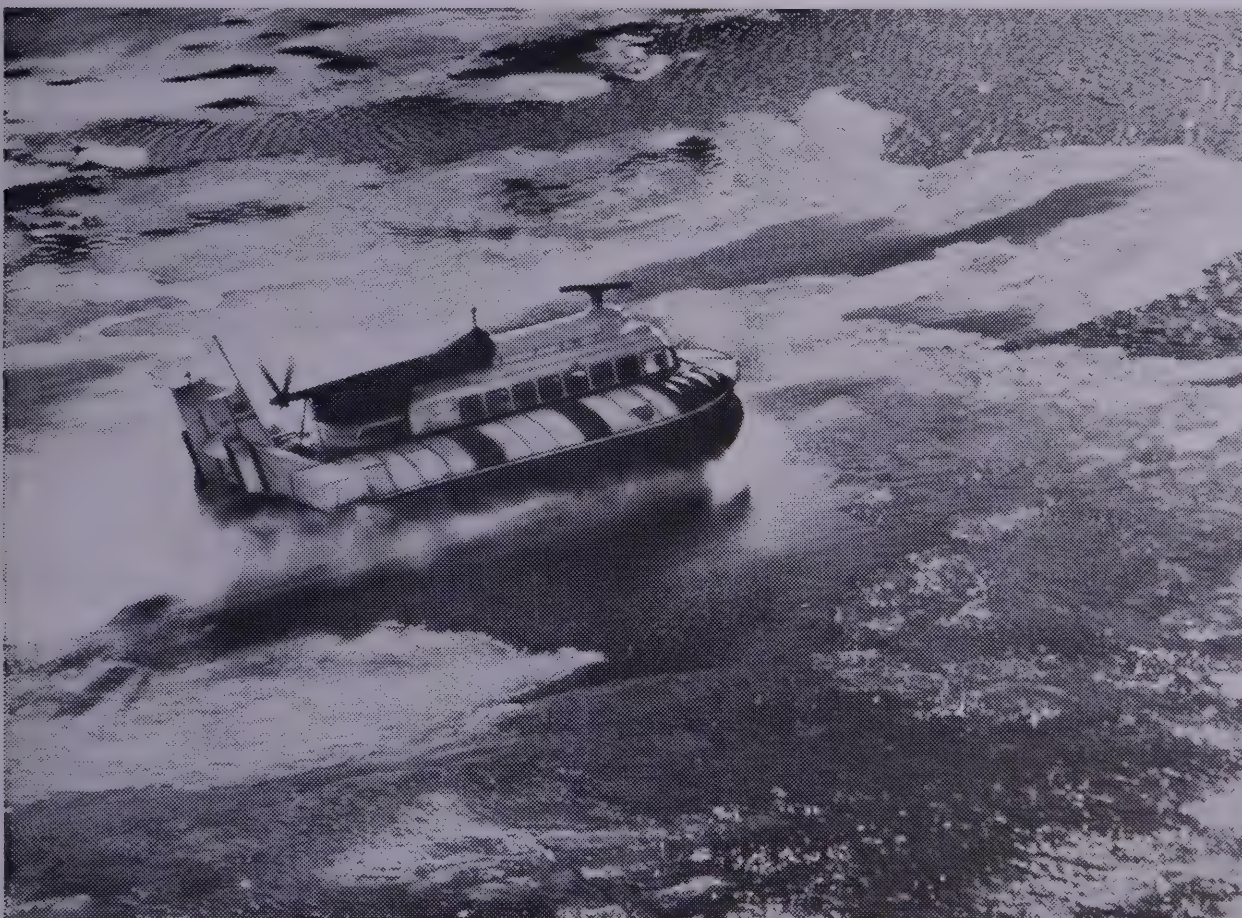
SK-10 AMPHIBIOUS LANDING CRAFT, 60-TON PAYLOAD AIR CUSHION VEHICLE

BELL AEROSYSTEMS - A textron COMPANY

Canada is launching its new century...

WITH THE NEWEST IDEA IN TRANSPORTATION

British Hovercraft Corporation and Bell Aerosystems Canada, world leaders in the development of air cushion vehicles, have joined forces to bring benefits of this new mode of transportation to Canada. Few areas of the world stand to gain more from the development and use of ACV's than Canada. Capable of traveling at high speeds over water, snow, ice, muskeg, tundra or reasonably flat terrain, these new amphibious craft will soon be engaged in exploration, public transportation, drilling, mining, policing, patrol, rescue, and other commercial and civic operations. Call or write today for further information about this new Canadian enterprise and its vehicles.



SR.N5/SK-5 Length 39 ft. 2 in. | SR.N6/SK-6 Length 48 ft. 5 in. | SK-9 Length 55 ft. 8 in. | BH-7 Length 78 ft. 8 in. | SK-10 Length 80 ft. | SR.N4 Length 130 ft. 2 in.

BRITISH HOVERCRAFT CORPORATION BACH **BELL AEROSYSTEMS CANADA**

Division of Textron Canada Limited

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AD NO. 61-1

british hovercraft corporation limited

SRN4

AN OPEN-WATER PASSENGER / CAR FERRY

THE SR.N4

The SR.N4 is a 165-ton hovership suitable for scheduled all-year-round services over open coastal water routes, such as the English Channel, for stage lengths of up to 100 nautical miles where waves 8 to 12 ft high can prevail.

The design is backed by thousands of hours of successful operational experience, accumulated throughout the world by B.H.C. hovercraft, which has resulted in them becoming a fully proven form of amphibious transport.

SR.N4 is now in batch production, and orders have been placed for craft to be put into service as passenger/car ferries.

In its basic form, 174 seated passengers and 34 cars can be accommodated.

In its standard form, the passenger/car ratio has been increased, giving accommodation for 254 passengers and 30 cars.

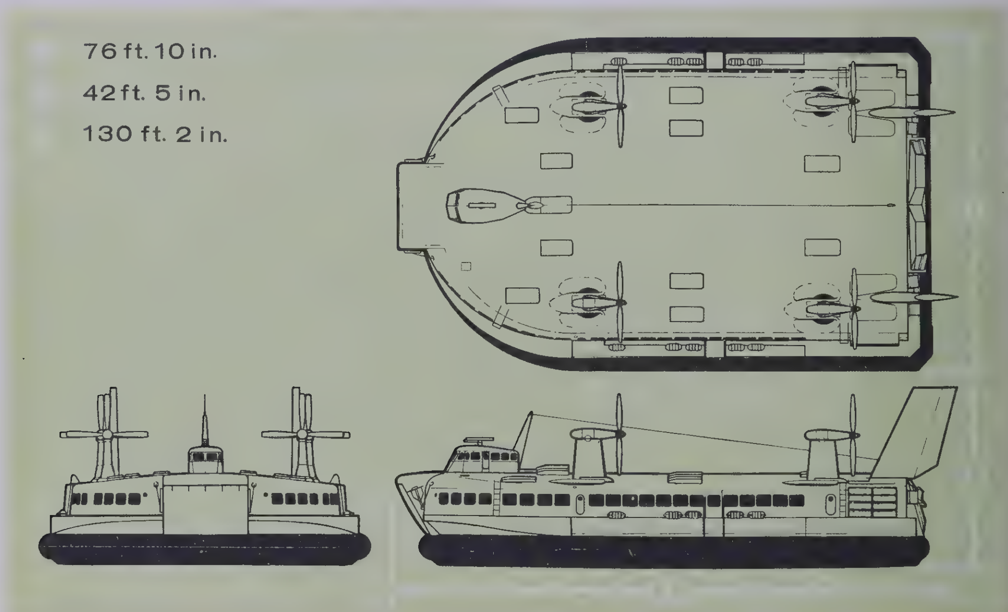
An all-passenger version can provide 609 seats.

The car deck is in the centre of the craft, with large doors in the stern and a ramp in the bow to provide a drive-on/drive-off facility. On either side of the car deck are the passenger saloons, equipped with comfortable seats for all passengers and with large windows extending the full length of the craft.

Above the car deck is the control cabin which, being sited well forward, provides the three-man operating crew (commander, engineer and radar operator/navigator) with all-round visibility.

The SR.N4 is powered by four Bristol Siddeley 'Marine Proteus' gas turbine engines, each one driving a variable-pitch propeller mounted on a pylon. Interconnected with the propellers are four centrifugal fans for cushion air. The craft is controlled by varying the propeller blade angles, and by swivelling the pylons to change the direction of thrust. If a single engine should fail, the craft can still proceed on the remaining three; in the unlikely event of two or more engines failing, being completely buoyant, it can move as a displacement vessel on the remaining engines. Auxiliary power units and minor electrical generating systems are fully duplicated.

Special attention has been paid to minimising noise by the selection of appropriate fan and propeller tip speeds.



specification

Type	SR.N4 Passenger/car ferry
Operating Crew	Commander, Engineer, Navigator/ Radar Operator

Supplementary crew in the form of stewards and deckhands would be required, dependent upon the craft role. A nominal total crew of five has been allowed in the weight summaries.

Capacity	
Basic craft	174 passengers, 34 cars
Standard craft	254 passengers, 30 cars
Dimensions	
Length	130 ft. 2 in. (39,68 m.)
Beam	76 ft. 10 in. (23,46 m.)
Height	42 ft. 5 in. (12,95 m.)
Bow ramp aperture	18 ft. x 11 ft. 6 in. (5,5 m. x 3,5 m.)
Stern door	31 ft. x 11 ft. 6 in. (9,4 m. x 3,5 m.)
Headroom, car deck	11 ft. 3 in. (3,4 m.)
Power plants	Four, Bristol Siddeley 'Marine Proteus' 3,400 s.h.p. max. cont. rating.
Auxiliary power units	Two Rover IS/90 gas turbines.
Propellers	Four, Hawker Siddeley Dynamics, four-bladed, 19 ft. (5,8 m.) dia. controllable pitch.
Fans	Four, Westland, twelve-bladed 11 ft. 6 in. (3,5 m.) dia. centrifugal, fixed pitch.
Fuel	Standard aviation kerosene DERD 2494 (AVTUR) (diesel fuel specification D.E.F. 2402-A may be used as an alternative)
Tankage	Twelve, in four groups of three.
Capacity *Normal*	3,400 Imp. gall. (15 456 litres).
Maximum	4,500 Imp. gall. (20 457 litres).
Electrical systems	200 volt, 3-phase, 400 c/s AC supplied by two generators driven by A.P.U.s, or from external supply. 28 volt DC supplied by main and reserve batteries, or from external supply.

weights

Nominal weights	
Basic weight, equipped with full furnishings, radar, radio and safety equipment	101·5 tons (103,1 tonnes)
Disposable load	63·5 tons (64,5 tonnes)
Capacity fuel load	16 tons (16,26 tonnes)
Normal A.U.W	165 tons (167,6 tonnes)
Overload disposable load	83·5 tons (84,8 tonnes)
Overload A.U.W.	185 tons (187,9 tonnes)

Basic craft – 34 cars and 174 passengers

Basic weight		101·5 tons (103,1 tonnes)
Disposable load		
Crew	0·45	
Cars, passengers and luggage	50·55	
Fuel	12·00	
Total	63·0	63·0
Normal A.U.W.		164·5 tons (167,1 tonnes)

Standard craft – 30 cars and 254 passengers

Basic weight		105 tons (106,7 tonnes)
Disposable loads		
Crew	0·45	
Cars, passengers and luggage	52·85	
Fuel	8·0	
Total	61·3	61·3
Normal A.U.W.		166·3 tons (168,7 tonnes)

performance

The following estimated average performance figures have been derived from established prediction methods with due account taken of towing tank and wind tunnel tests using scale dynamic models.

With the exception of the overwave and gradient performance the performance is given for calm water and still air conditions.

All values are quoted under ISA conditions.

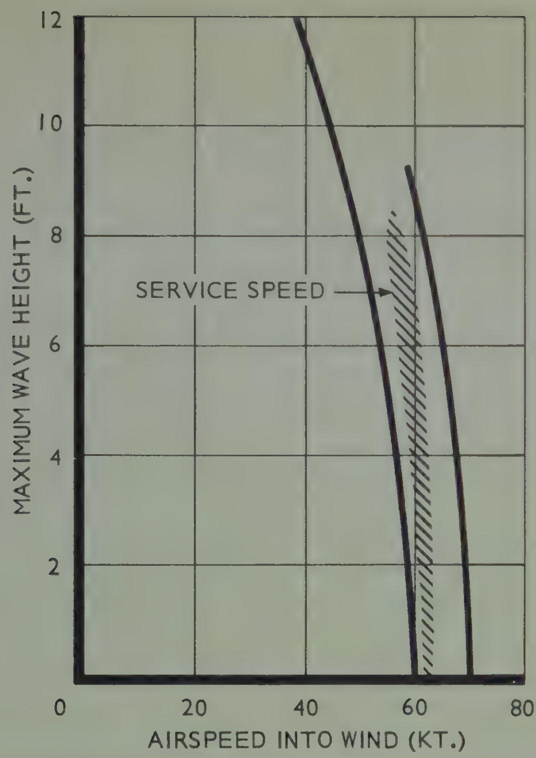
No allowance has been made for the effects of 'plenum bleed' air intakes to the Proteus engines which have distinct advantages when operating in cold climates (de-icing) and minimises the ingress of dust and sand when operating in arid and desert areas.

It should be noted that the quoted maximum speeds assume the craft to be correctly trimmed, whereas the 'Service Average' speed is a typical speed readily achieved by the average commander.

The 'Service Average' speed has been found to be some 90% of the maximum from experience obtained with the production SR.N6.

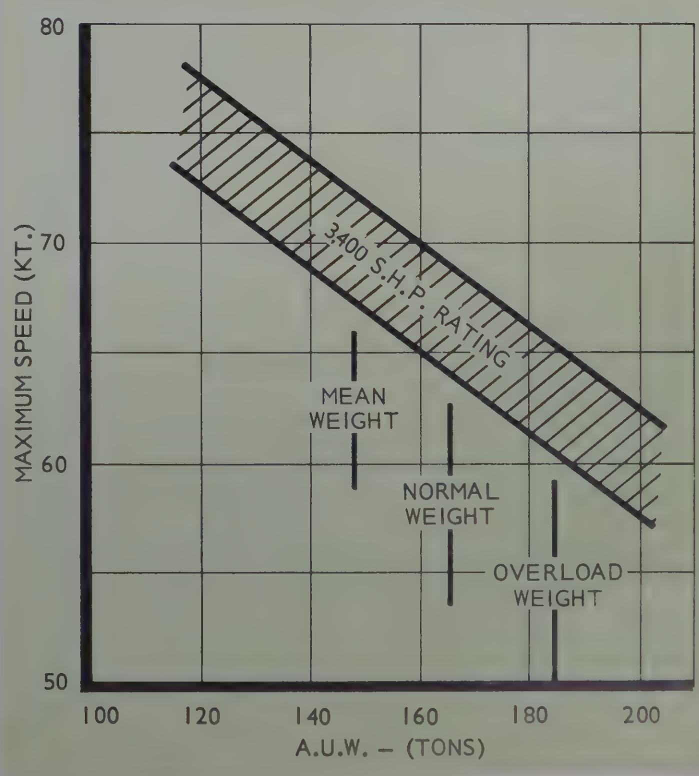
The quoted mean operating weight is a typical average of the passenger/car layouts in either the basic or standard form, assuming 75% load and half fuel used.

Mean operating weight	147·5 tons (150 tonnes)
Max. speed (optimum trim) max. power	77 knots (143 km./hr.)
Max. speed (optimum trim) max. cont. power	70 knots (130 km./hr.)
Service average speed, max. cont. power	61 knots (113 km./hr.)
Airspeed into wind in 4–5 ft. waves (Channel type seas)	55–65 knots (102-120 km./hr.)
Airspeed into wind in 8–10 ft. waves (Channel type seas)	50–60 knots (93-111 km./hr.)
Time to accelerate to 50 knots	55 sec.
Normal stopping distance from 50 knots	525 yards (480 m.)
Emergency ditching distance from 50 knots	175 yards (160 m.)
Normal turn radius at 40 knots	860 yards (786 m.)
Endurance on 10 tons fuel at max. cont. power	2·5 hours
Calm water range at max. cont. power	175 n. miles
Negotiable gradient from standing start	1: 11



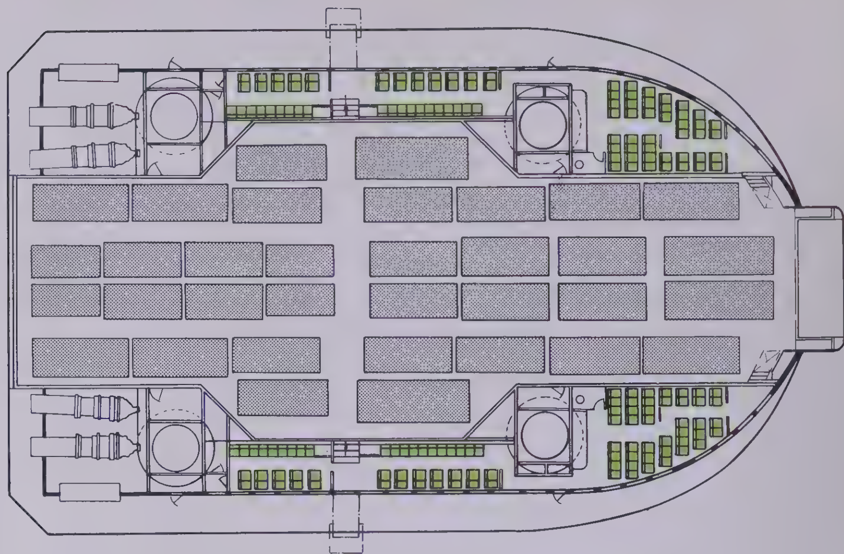
Overwave performance (Channel type seas)

Speed performance



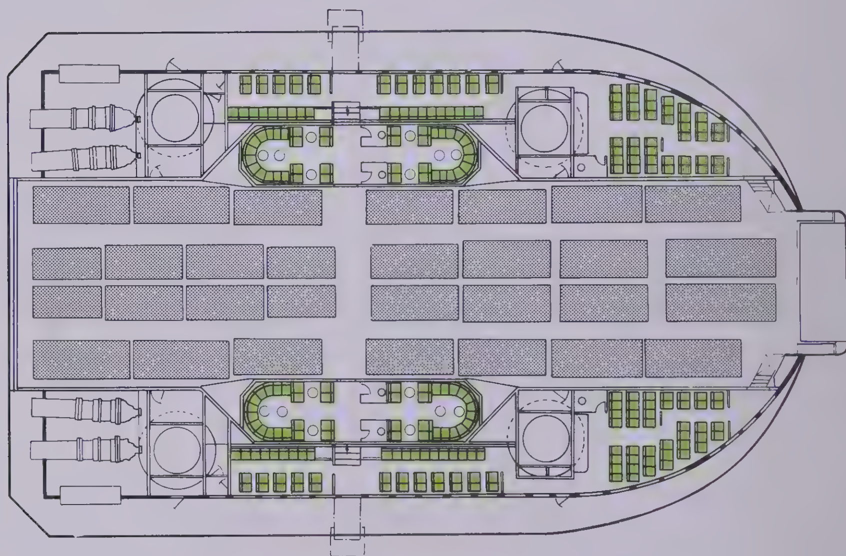
typical car and passenger layouts

**174 passengers
34 cars**



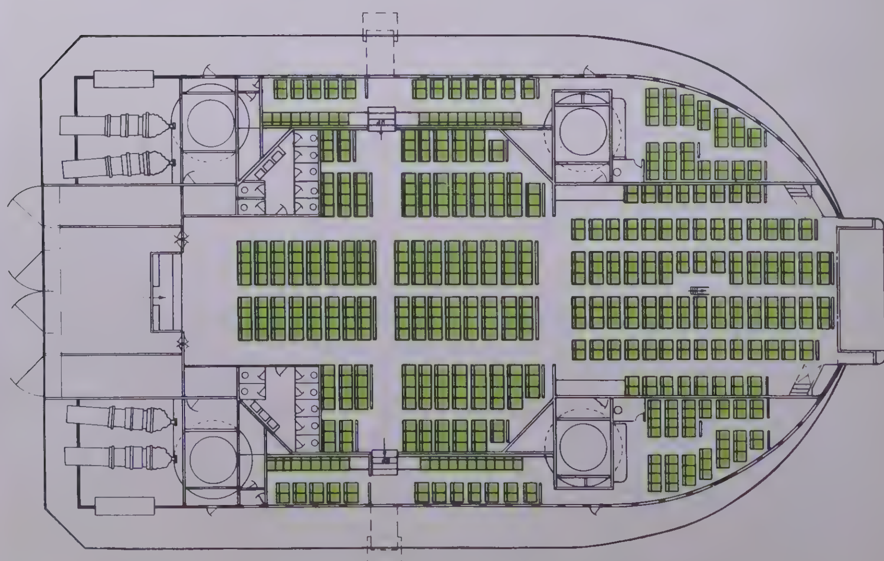
basic craft

**254 passengers
30 cars**



standard craft

609 passengers



all-passenger craft

A rapid turn-round time has been the criterion for establishing the accommodation layouts of the SR.N4.

To achieve this all vehicles are loaded at the stern through a doorway extending the full width of the car deck, and are unloaded through the bow by means of an integral ramp.

Retractable stairways on either side of the craft enable passengers to be embarked or disembarked concurrently with the vehicles.

basic craft

This layout provides for 34 cars of average length 13 ft. 6 in. and 174 seated passengers with associated luggage. The area of car deck provides ample space between vehicles allowing the occupants to leave and re-enter them. Toilet facilities are provided.

The payload of approximately 51 tons quoted in the disposable load assumes that all the car passengers are seated in the passenger cabins provided.

On short routes car passengers may or may not be allowed to remain in their cars depending on local licencing requirements. If car passengers were considered to be in addition to the 174 seated foot passengers this would result in 5 to 10 tons of acceptable overload, depending on the fuel carried.

standard craft

This version, ordered by the Swedish Lloyd Line and the Swedish American Line is intended for operation over routes of between 15 and 100 miles, and has been provided with additional seating.

The midship bays at each side of the car deck on the basic craft have been enclosed and converted into saloons to accommodate an additional 80 passengers, thereby increasing the total seating capacity to 254 and slightly reducing the car capacity to 30.

all-passenger craft

This layout provides for passengers only and the centre deck has been laid out to seat 435 passengers and the side saloons 174, a total of 609. For other than routes under 10 miles, toilet facilities and a bar are provided.

The all-passenger craft is a typical example of the many alternatives to which the basic craft could be modified.

engineering

The prime systems of the SR.N4 have proved their reliability and efficiency in hovercraft already in operational service. The integrated lift/propulsion system has been evolved from that used so successfully in the SR.N2, SR.N3, SR.N5 and SR.N6 hovercraft and the system for controlling the craft, by swivelling the propeller pylons and varying the propeller blade pitch angles, is similar in principle to that used on the SR.N2 and SR.N3.

To ensure maximum utilization, ease of maintenance is a prime factor of the design. Lifting gear has been designed for removal of the major components and built-in jacking points enable the craft to be raised to skirt height so that skirts and the underside of the craft can be inspected.

structure

The buoyancy tank forms the structural basis of the craft and is built around a grid of longitudinal and transverse frames, this grid is repeated on the superstructure to form the passenger carrying decks and the roof; the two are joined by longitudinal members to form an extremely stiff fore and aft structure. Lateral bending is taken mainly by the buoyancy tank.

The top surface of the buoyancy tank forms the vehicle deck. The panels over the centre are thicker since this area has been designed to carry unladen coaches or commercial vehicles while the remainder is designed to carry cars and lighter vehicles. The entire vehicle deck is covered with adequate non-slip material.

Secondary passenger-carrying decks are elevated above the buoyancy chamber at the sides of the craft. The resultant spaces between the buoyancy tank top and the underside of the raised decks form plenum chambers into which the four lifting fans discharge. Each fan air intake is bifurcated and has a thwartships bulkhead at both front and rear supporting a beam carrying the transmission main gearbox and the propeller pylon. The all-moving fins and rudders behind the aft pylons pivot on pintles situated just ahead of the rear bulkhead.

A loading ramp, which can be lowered to ground level, is built into the forward end of the craft and doors extending the full width of the centre deck are fitted at the aft end.

skirts

The open water capability of the hovercraft is undoubtedly due to the introduction of the long skirts and these are under continuous development. The original system of peripheral skirts with a thwartships stability trunk has been modified by making the lower third of the skirt in the form of 'fingers' through which the cushion air is directed. This principle, coupled with the greater flexibility of the 'fingers', contributes to improved control, stability and comfort.

power units & transmission

The craft is powered by four Bristol Siddeley 'Marine Proteus' free turbine turbo-shaft engines mounted in pairs at the rear of the craft on each side of the vehicle deck. Each engine is connected to one of four identical propeller/fan units, two forward and two aft. The propellers are four-bladed and of 19 ft. diameter.

Westland 12-bladed centrifugal fans, 11 ft. 6 in. in diameter, provide air to the peripheral jet system.

The 'Marine Proteus' engine has a maximum continuous rating of 3,400 s.h.p. and up to 4,250 s.h.p. is available for an emergency or for limited use in extreme weather conditions. Since the gear ratios between the engine, fan and propeller are fixed, the propeller/fan power distribution ratio is varied by changing the propeller pitch. This system is termed integrated lift/propulsion.

The engines and auxiliaries are readily accessible for maintenance from inside the craft. Engines, propellers, pylons, and all gearboxes can be removed for overhaul without disturbing the fans or the main structure.

The fans rotate on pintles which are attached to the main structure and each fan assembly may be detached and removed through the side of the plenum chamber without disturbing major structural items.

control system

The craft control system is based on experience gained with the present range of Westland hovercraft, especially the SR.N3, and on extensive SR.N4 model tests. The Commander's controls consist of a rudder bar for moving the pylons differentially to turn the craft at speed, a control wheel for moving them together to produce a side force, and propeller pitch levers for controlling the thrust and yawing moments from the propellers. The control wheel is mounted on a column, fore-and-aft movement of which alters the propeller pitches collectively about datums set by the pitch control levers and thus controls forward and reverse thrust. In addition, there are the appropriate controls and instruments for the four engines.

fuel system

The fuel is contained in four groups of three tanks, giving a total usable capacity of 4,500 Imperial gallons (16,3 tonnes). The fuel is also used in the ballast system.

A pressure refuelling point is provided on each side of the craft, these are designed for a refuelling rate of 300 gallons per minute. The craft can be refuelled with a normal fuel load in approximately 6 minutes if both refuelling points are

used. The system has been designed for maximum reliability. Fuel can be transferred between tanks and each port and starboard pair of engines is fed from two groups of tanks so that in the event of failure of the supply from one group the engines can continue to operate.

Should a fuel pump fail the transfer pumps can be used to maintain supplies.

hydraulics and lubrication

All controls are hydraulically operated and each has a separate system. This confers a high degree of safety and obviates the necessity for the long pipelines which would normally be associated with a craft of this size.

Each propeller transmission gearbox drives its own hydraulic system for initiating pylon deviation and propeller pitch change. The two aft propeller gearbox systems additionally supply power to jacks for operating the all-moving fins; the rudders are geared to the fins.

Two separate electro-hydraulic systems operate the car deck ramp, rear doors, retractable passenger steps, and lift fan intake shutters.

Each engine, gearbox and propeller has its own self-contained lubrication system and, in consequence, should a failure occur in a lubrication system only its associated components will be affected.

ventilation and heating

The main lifting fans are utilised to ventilate the craft, and heating is provided by hot air bled from the engine compressor. This heated air is mixed with fresh ram air and distributed through panels in the roof of the craft.

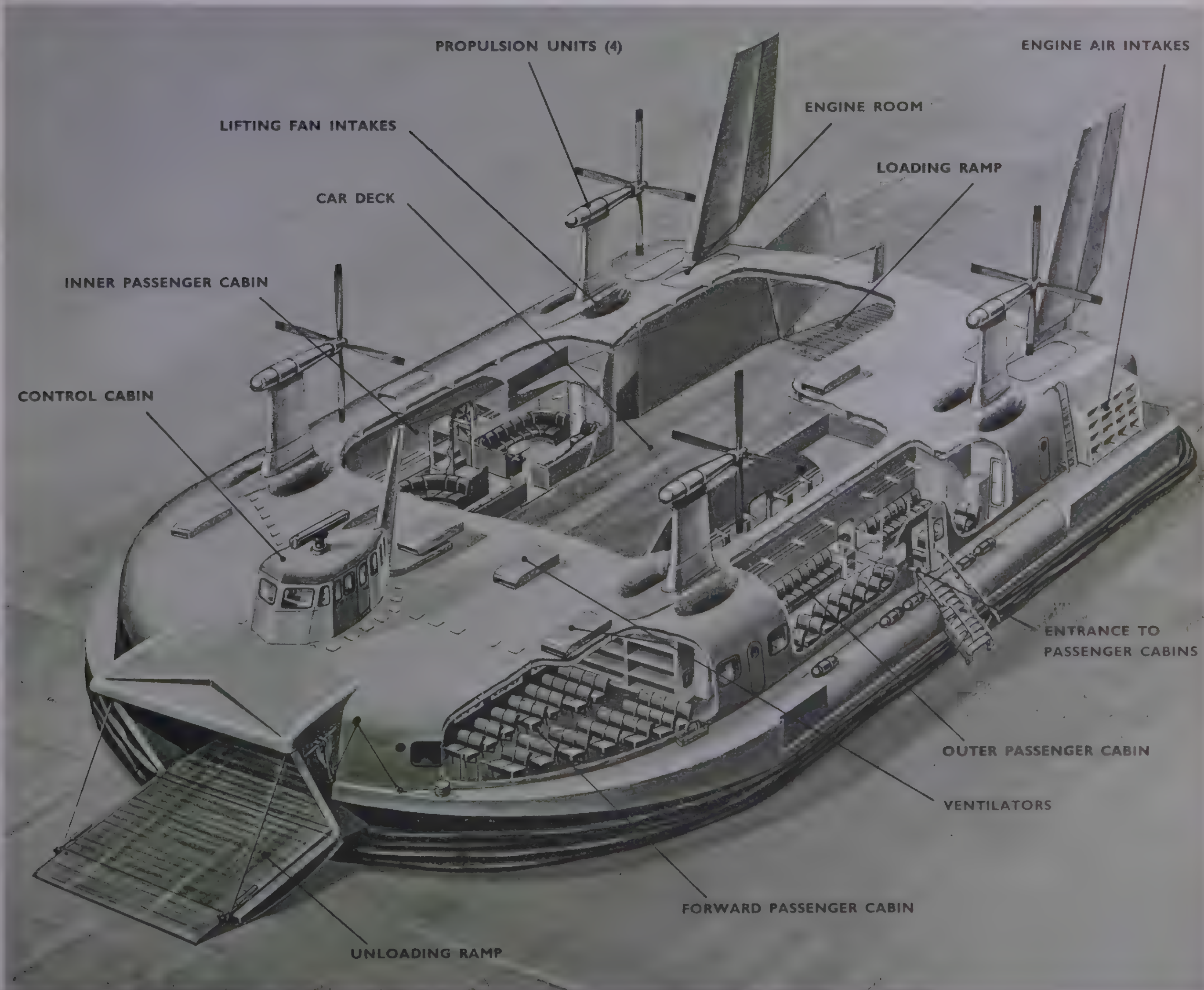
noise level

In designing the SR.N4 particular attention has been paid to the minimization of noise and to this end the propeller tip speed has been reduced to Mach. 0·6 by using 19 ft. dia. propellers; this has been achieved without any loss of performance. The aft location of the power units was largely determined by the desire to insulate the passenger from engine noise.

servicing

The SR.N4 has been designed with ease of servicing in mind and all components and systems are readily accessible for maintenance and replacement purposes.

The only large piece of equipment required for major servicing operations is a mobile crane.



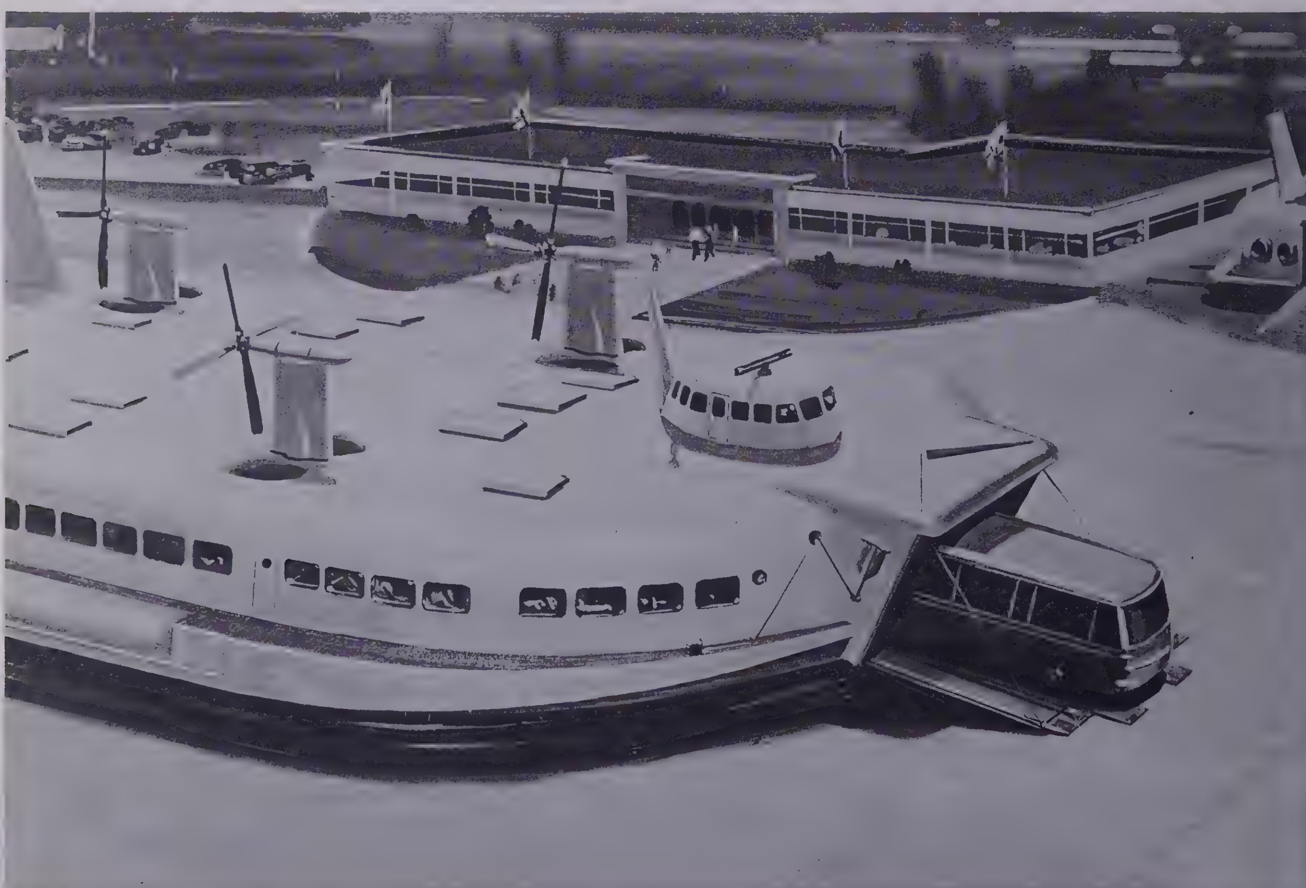
operational facilities

The SR.N4 has been designed specifically to enable short turn-round times to be achieved. The location and layout of a hoverport is dictated more by the necessity to handle a large number of passengers and cars than the requirements of the craft, particularly on an international route where Customs clearance is necessary. The siting of the hoverport need not be governed by existing deep water ports or channels as the SR.N4 can be operated from little more than a hard standing with a simple approach ramp built on an area of four acres of sheltered shore and in reasonable proximity to road and rail connections.

The ideal and recommended layout is one that has two approach ramps at 120° to each other. This arrangement enables the craft to arrive by one ramp and depart by the other and reduces the manoeuvring to a change in direction of only 60° with consequent reduction in the turn-round time. This type of site is of necessity large and would occupy approximately eight acres of land. It would be capable of handling one SR.N4 every seven minutes with a traffic potential of 300 cars and 2,500 passengers each way per hour.

It is appreciated that operators may wish to utilise existing port arrangements, particularly if road and rail connections are convenient to the site or if the coast line is too rugged, as in Scandinavia, and suitable beaches are not available.

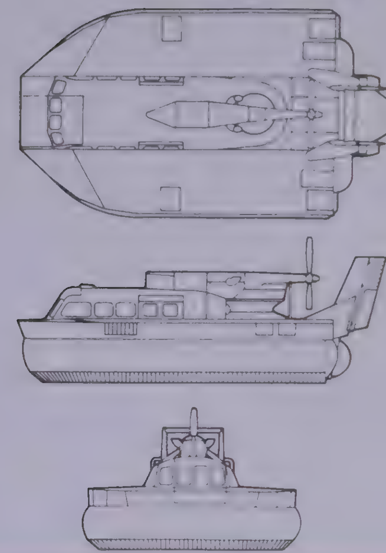
In these cases the harbour wall may be pierced by a ramp leading up to an apron having a central landing area. It is also possible to operate the SR.N4 from an existing quay provided the tidal variation is not too great and that suitable fendering is available.



british hovercraft corporation limited

YEOVIL SOMERSET, AND EAST COWES ISLE OF WIGHT, ENGLAND

Publication No. SP.811 issue 3. October 1966. Printed in England



SK-5 COMMERCIAL

The Bell SK-5 Model 7250 Air Cushion Vehicle (ACV) is a versatile, high-performance craft which is capable of a wide range of commercial applications. It can be utilized as an emergency vehicle for firefighting, search and rescue missions, for high-speed passenger transportation and harbor and river patrol.

A single 1150 shaft-horsepower marine gas turbine engine drives both the lift fan, which forces air downward to create the air cushion beneath the craft, and the aft-mounted propeller which provides propulsion.

The 7-1/2 ton SK-5 appears to ride only a few inches above the surface, but the hard bottom of the craft actually travels on an air cushion more than four feet thick. This is made possible by its flexible, air-actuated trunks, which also give the SK-5 greater obstacle clearance and ditch crossing capability over land and improved riding qualities over water.

Control of the SK-5 is achieved by a trunk-lifting system, a puff-port system and by rudders mounted in the slipstream of the propeller.

A large buoyancy chamber, subdivided into watertight compartments and extending almost the entire length and width of the SK-5, assures floatation in any sea condition.

The Bell SK-5 has proven its ability to perform a variety of missions during several demonstration, evaluation and operational programs in the U.S. and Canada. These include an eight-week, 720-mile demonstration tour along the Gulf Coast from Houston, Texas, to Florida; operational evaluation by the Canadian Coast Guard; the first ACV passenger service in the U.S. in the Oakland-San Francisco Bay area of California; and several operations in such locations as Seattle, Washington; on Alaska's Cook Inlet; and a 500-mile round trip over a maximum range of winter ice conditions from Buffalo, N.Y. to Pelee Island, Ontario.

BELL AEROSYSTEMS
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SPECIFICATIONS

DIMENSIONS:

Length	38 ft 10 in.
Beam (inflated trunks)	23 ft 9 in.
Height	15 ft 11 in.
Cabin floor area	12 ft by 7 ft 8 in.
Door opening	5 ft by 9 in. high by 5 ft 7 in.

WEIGHTS:

Basic craft empty		9,857 lb
Basic load		
crew, ballast, fuel	2,718 lb	
Load allowance	4,425 lb	
Total normal load	7,143 lb	7,143 lb
Gross weight (normal)		17,000 lb
Additional load (overload)		3,000 lb
Gross weight (max. overload)		20,000 lb
Passenger capacity		16 plus operator

POWER PLANT

Engine	One General Electric 7LM-100 PJ102 marine gas turbine rated at 1150 shaft-horsepower at 80°F
Propeller	One three-bladed, variable pitch, 9 ft diameter Hamilton Standard
Lift Fan	One 7 ft diameter centrifugal
Fuel	Kerosene-type JP4/JP5
Fuel capacity	318 gal

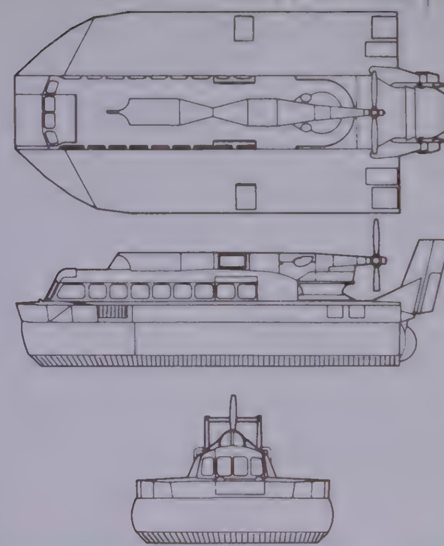
PERFORMANCE: at 17,500 lb

Maximum speed	60 knots (70 mph)
Range	175 n.mi. at 50 knots
Endurance	3.5 hr at 50 knots
Maximum gradient at hover conditions	1 in 7.5
Maximum gradient (50 yd) Capability at 25 knots	1 in 3
Wave clearance at 40 knots	4.5 ft

OBSTACLE CLEARANCE:

Solid wall	3.5 ft
Earth mound	5 ft
Vegetation	5-6 ft

Ditches up to 12 ft wide and 8 ft deep can be crossed at 20 knots.



SK-6

The Bell SK-6 Air Cushion Vehicle (ACV) is a versatile craft with extensive capabilities for military and commercial applications. Being completely amphibious it can operate from relatively unsophisticated bases for search and rescue missions, firefighting, harbor and river patrol, for high-speed public transportation, and as a logistic support craft or utility freight carrier.

A single 1150 shaft-horsepower marine gas turbine engine drives both the lift fan, which forces air downward to create the air cushion beneath the craft, and the aft-mounted propeller which provides propulsion.

Although the ten-ton SK-6 appears to ride a few inches above the surface, the hard bottom of the craft is supported by a four foot cushion of air. This is accomplished by flexible skirts, which give the SK-6 excellent obstacle clearance or ditch crossing capability over land and improved riding qualities over rough water and waves.

Control of the SK-6 is achieved by a skirt-lifting system, a puff-port system and by rudder mounted in the slipstream of the propeller.

The SK-6 accommodates 33 passengers in its roomy, soundproofed, air conditioned cabin. However, passenger seats can be quickly removed to convert the craft into a cargo carrier with 164 square feet of floor space.

The SK-6 is a stretched version of the proven Bell SK-5 vehicle which has accumulated thousands of operating hours throughout the world.

BELL AEROSYSTEMS

BUFFALO, NEW YORK — A textron COMPANY

SPECIFICATIONS

DIMENSIONS

Length	48 ft 6 in.
Beam (inflated trunks)	23 ft 9 in.
Height	15 ft 11 in.
Cabin floor area	21 ft 8 in. by 7 ft 8 in.
Door opening	5 ft 9 in. high by 5 ft 7 in. wide

WEIGHTS

Basic craft empty		11,463 lb
Basic load		
crew, ballast, fuel	2,718 lb	
Load allowance	7,819 lb	
	10,537 lb	10,537 lb
Gross weight (normal)		22,000 lb
Additional load (overload)		3,000 lb
Gross weight (max. overload)		25,000 lb
Passenger capacity		33 plus operator

POWER PLANT

Engine	One General Electric 7LM-100 PJ102 marine gas turbine rated at 1150 shaft-horsepower at 80°F
Propeller	One three-bladed, variable pitch, 9 ft diameter Hamilton Standard
Lift fan	One 7 ft diameter centrifugal
Fuel	Kerosene-type JP4/JP5
Fuel capacity	318 gal

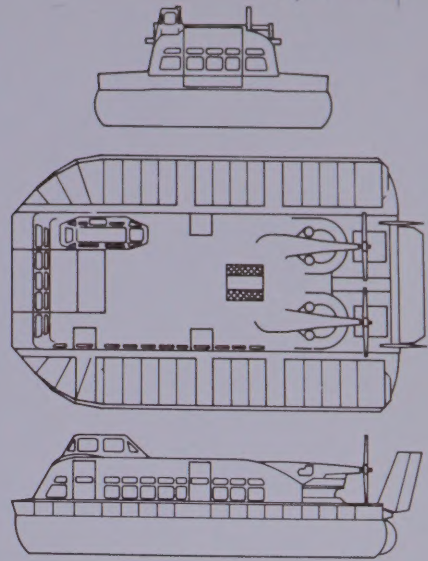
PERFORMANCE: (at normal gross weight in I.S.A. conditions)

Maximum speed	56 knots (65 mph)
Range	160 n.mi.
Maximum gradient at hover conditions	1 in 10
Maximum gradient (50 yd) Capability at 25 knots	1 in 3.5
Cruising speed in 4-5 foot waves	35-45 mph
Endurance	3.5 hr at 50 knots

OBSTACLE CLEARANCE

Solid wall	3 ft 6 in.
Earth mound	5 ft
Vegetation	6 ft

Ditches up to 16 ft wide and 8 ft deep can be crossed at 22 knots.



SK-9

The high performance Bell SK-9 Air Cushion Vehicle is an amphibious transport designed for passenger-carrying operations. It will cruise over calm water at 65 MPH, and through 4- to 5-foot waves at 45 MPH with a full payload. A cargo transport version, the SK-9B, is also available.

The SK-9 utilizes many of the proven components of the highly successful SK-5 which has accumulated thousands of hours of operating time throughout the world in commercial and military operations.

The large cabin accommodates 90 passengers comfortably and has provisions for two tons of baggage or cargo. Passenger loading doors which are located in the bow and on each side of the cabin area allow quick loading and unloading to minimize turn-around time. This feature combined with the fast cruising speed of 65 MPH is essential to an economical passenger-carrying operation.

Two 1250 shaft horsepower gas turbine engines furnish economical power for the SK-9. Each engine drives a 9-foot diameter variable pitch propeller and a large lift fan (mounted in the hull) which produces the cushion of air for the 25-ton craft. The twin propeller arrangement permits excellent directional control during maneuvers, with the two rudders providing yaw control. A unique "puff-port" air bleed system provides a lateral control, while pitch and roll trim can be varied while underway by the operator. The inherent stability of the SK-9 makes it easy to handle and the simple control system enables the rapid training of operators.

SPECIFICATIONS

DIMENSIONS:

Length	55 Feet 8 Inches
Width	32 Feet 10 Inches
Height	16 Feet 6 Inches
Cabin Floor	29 Feet x 17 Feet 8 Inches
Door Opening (Bow)	7 Feet 4 Inches x 6 Feet 4 Inches (plus auxiliary doors)

WEIGHTS:

Normal Gross Weight	47,000 pounds
Overload Gross Weight	52,000 pounds
Normal Payload	17,600 pounds
Normal Useful Load	22,750 pounds
Passenger Capacity	90
Crew	Two

POWER PLANT:

Engine	Two marine gas turbine Maximum Continuous Rating 1250 SHP
Propeller	Two four-blade, variable pitch, 9-foot-diameter
Lift Fan	Two 7-foot diameter centrifugal
Fuel Capacity	680 gallons
Fuel	Kerosene-type

PERFORMANCE: (At normal gross weight in I.S.A. conditions)

Maximum Speed	70 MPH
Range	210 miles
Maximum Gradient - Static Conditions	12%
Cruising Speed in 4-5 Foot Waves	45 MPH

PERFORMANCE OVER OBSTACLES:

Solid Wall	3 Feet 6 Inches
Earth Mound	5 Feet
Vegetation	6 Feet

Ditches up to 18 feet wide and 8 feet deep can be crossed at 25 MPH

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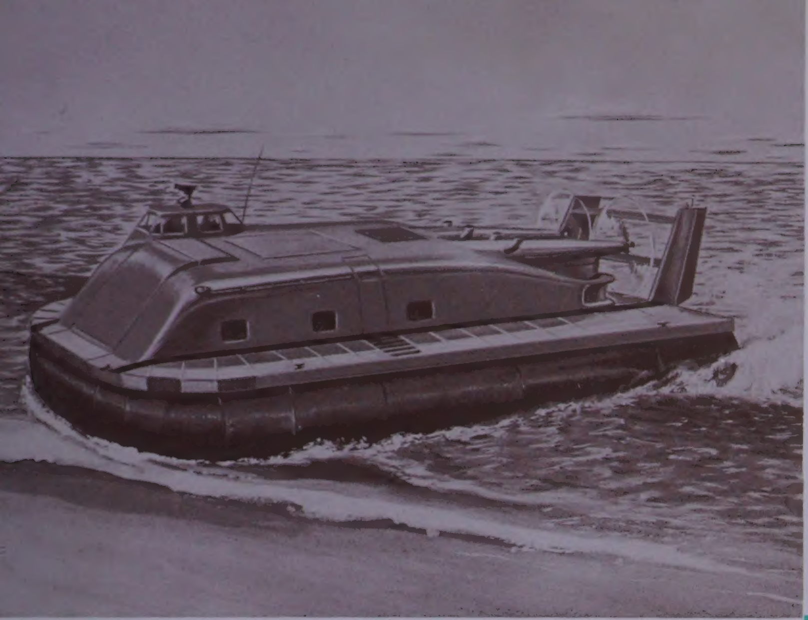

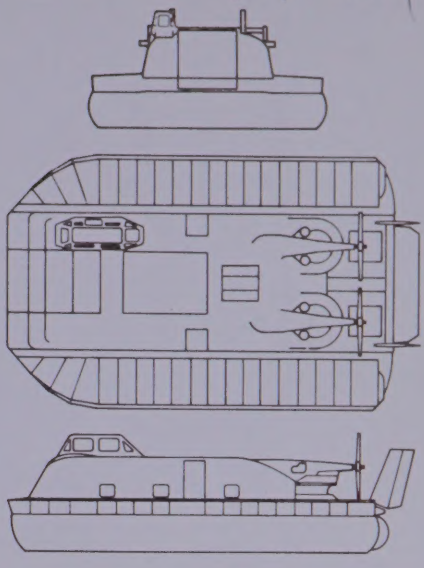

SK-9B

The Bell SK-9B Air Cushion Vehicle is a high performance amphibious craft designed for cargo-carrying operations. With a full payload, it will cruise over calm water at 70 MPH, and through 4- to 5-foot waves at 50 MPH. A 90-passenger transport version, the SK-9, is also available.

The SK-9B utilizes many of the proven components of the highly successful SK-5 which has accumulated thousands of hours of operating time throughout the world in commercial and military operations.

The large cargo compartment accommodates 10 tons of low density freight. A loading door is provided in the bow, and the hatch in the roof permits overhead loading. The bow entrance is 7 feet high and 6 feet wide, and opens as an integral ramp. The overhead hatch is 7 feet square. In addition, auxiliary doors are provided on each side of the cargo compartment. The multiple entrances provide flexibility to expedite cargo handling.

Two 1250 shaft horsepower gas turbine engines furnish economical power for the SK-9B. Each engine drives a 9-foot diameter variable pitch propeller and a large lift fan (mounted in the hull) which develops the cushion of air for the 25-ton craft. The twin propeller arrangement permits excellent directional control during maneuvers, with the two rudders providing yaw control. A unique "puff-port" air bleed system provides a lateral control, while pitch and roll trim can be varied while underway by the operator. The inherent stability of the SK-9B makes it easy to handle and the simple control system enables the rapid training of operators.

SPECIFICATIONS

DIMENSIONS:

Length	55 Feet 8 Inches
Width	32 Feet 10 Inches
Height	16 Feet 6 Inches
Cabin Floor	29 Feet x 17 Feet 8 Inches
Door Opening	7 Feet 4 Inches x 6 Feet 4 Inches (Plus auxiliary doors)

WEIGHTS:

Normal Gross Weight	45,350 pounds
Overload Gross Weight	52,000 pounds
Normal Payload	17,700 pounds
Normal Useful Load	22,850 pounds
Maximum Payload	24,000 pounds
Crew	Two

POWER PLANT:

Engine	Two marine gas turbine Maximum Continuous Rating 1250 SHP
Propeller	Two four-blade, variable pitch, 9-foot diameter
Lift Fan	Two 7-foot diameter centrifugal
Fuel Capacity	680 gallons
Fuel	Kerosene-type

PERFORMANCE: (At normal gross weight in I.S.A. conditions)

Maximum Speed	75 MPH
Range	225 miles
Maximum Gradient - Static Conditions	12%
Cruising Speed in 4-5 Foot Waves	50 MPH

PERFORMANCE OVER OBSTACLES:

Solid Wall	3 Feet 6 Inches
Earth Mound	5 Feet
Vegetation	6 Feet
Ditches up to 18 feet wide and 8 feet deep can be crossed at 25 MPH	

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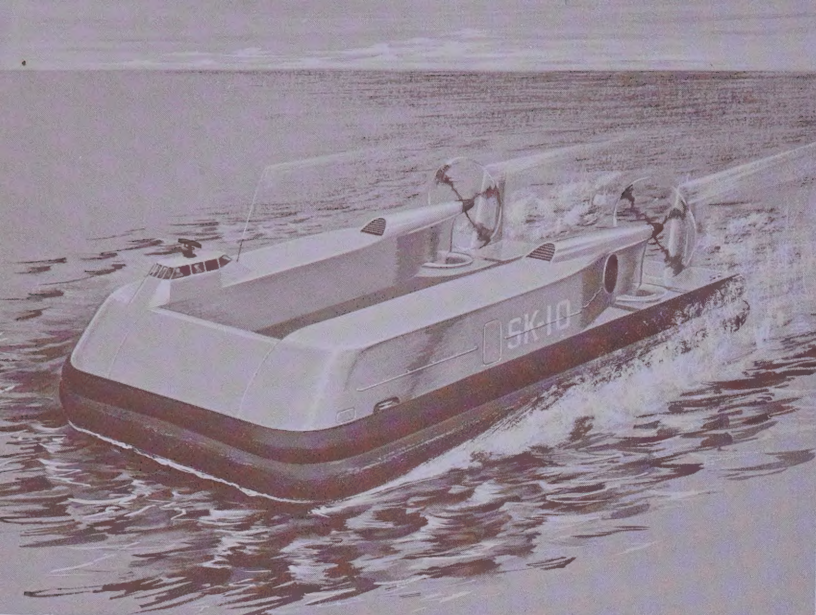

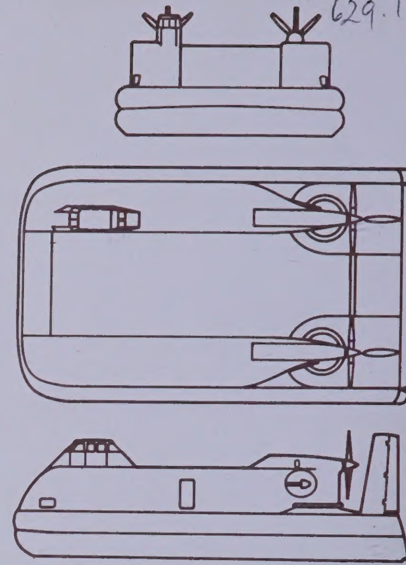

SK-10

A new concept for military air cushion vehicles has been designed by Textron's Bell Aerosystems Company. The SK-10 can quickly and efficiently transport personnel, supplies and equipment from a ship through the surf inland to an appropriate debarkation zone. With a 60-ton payload from stage lengths up to 100 nautical miles, the SK-10 can carry cargoes at 60 knots in sea state 3 or 80 knots in sea state 1 without regard to water depth or submerged hazards.

The craft utilizes an open well deck with bow and stern ramps which expedites the loading and unloading of cargo. A total of 160 troops can be carried in the port and starboard superstructure with provisions for 320 additional troops on the cargo deck when no cargo is carried.

With its flexible air-actuated trunks extending five feet below the hard structure, the SK-10 will operate into and out of a Landing Ships Dock (LSD), an Amphibious Transport Dock (LPD), and consideration has been given to the planned FDL and LHA ships.

Twin 12,000 shaft horsepower gas turbine engines provide power for the SK-10. Each engine drives a 14-1/2 foot diameter variable pitch propeller and a 12 foot diameter lift fan (mounted in the hull) which develops the cushion air for the craft. The twin propeller arrangement permits excellent directional control during maneuvers, with the two rudders providing yaw control. A unique "puff-port" air bleed system provides a lateral control, while pitch and roll trim can be varied while underway by the operator.

SPECIFICATIONS

DIMENSIONS:

Length	80 Feet
Width	48 Feet
Height	27 Feet
Cargo Area	1300 Square Feet
Bow Ramp	21 Feet 6 Inches Wide
Stern Ramp	13 Feet Wide

WEIGHTS:

Normal Gross Weight	295,000 Pounds
Normal Payload	120,000 Pounds
Normal Useful Payload	162,000 Pounds
Crew	Three/Four
Troop Capacity	Up to 500

POWER PLANT:

Engines	Two Marine Gas Turbines Max. Continuous Power - 12,000 SHP Two Marine Gas Turbines Max. Continuous Power - 525 SHP
Propeller	Two 4-Bladed, Variable Pitch 14 Foot 6 Inches - Diameter
Lift Fan	Two 12 Foot - Diameter Centrifugal
Fuel Capacity	6400 Gallons

PERFORMANCE: (At Normal Gross Weight in ISA Conditions)

Maximum Speed	80 Knots (Sea State 1) 60 Knots (Sea State 3)
Endurance	
60 Ton Payload	3 to 4 Hours
20 Ton Payload	12 Hours
Maximum Gradient - continuous	10%

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